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12th CSS Congress

It's time to talk about sleep.

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Society



Société Canadienne
du Sommeil

ABSTRACT BOOK

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ORAL SESSION 1: PEDIATRIC SLEEP - FROM INFANCY TO ADOLESCENCE

40 Transition from Biphasic Sleep to Monophasic Sleep: Identification and Characterization of Napping Patterns

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 1

Abstract | Résumé

Objective: Between the ages of 3 and 6 years, children transition from biphasic sleep (including naps and nighttime sleep) to monophasic sleep (nighttime sleep only). Since France introduced compulsory schooling at the age of 3 in 2019, managing individual napping needs in school can be difficult. This study aims to identify patterns of napping and associated factors during this transition period.

Methods: An online questionnaire was completed by 1317 parents of children aged 3 to 5 years ($M = 4.50$; $SD = 0.80$) enrolled in French nursery schools. It covered naps, nighttime sleep, bedtime rituals, falling asleep conditions, screen use and parents' beliefs. Latent class analysis was used to identify different nap patterns, and age-adjusted logistic regressions was used to identify factors associated with the classes.

Results: Five classes were identified: children napped (1) daily (25%), (2) regularly (17%), (3) only at school (14%), (4) only at home (17%) or (5) never (28 %). Children were more likely to nap if they were younger and if they slept less on weeknights. The parents of children who napped at home were more likely to nap themselves and more likely to report daytime fatigue in their child (whether the child napped daily, regularly, or only at home). According to the parents, regular nappers are more likely to have problems falling asleep in the evening. Finally, children who share a room are more likely to nap only at school.

Conclusion: Nap patterns in children aged 3-5 years vary widely and are influenced by external factors during the transition from biphasic to monophasic sleep. These classes relate to the context and quality of nighttime sleep, along with parental beliefs about napping. Given the changing needs of individuals, understanding these dynamics can help parents and educational teams to better support children at this important stage of their development.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

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43 Evaluation of a New Threshold for Positive Airway Pressure Therapy Adherence in Paediatric Populations

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 1

Abstract | Résumé

Background: Obstructive sleep apnea (OSA) in children is a common disorder of breathing during sleep that is characterized by upper airway obstruction and is treated using positive airway pressure (PAP) therapy. There is no standardized definition for PAP adherence for paediatric populations. Instead, current adherence criteria is based on the adult definition, defined as >4 hours of PAP use for at least 70% of nights. This relatively low threshold likely under-estimates PAP adherence in children, as children require more sleep than adults do. Thus, we propose defining paediatric PAP adherence as PAP usage for at least 6 hours per night for 100% of nights.

Objective: The objective of this study is to evaluate PAP adherence in children with OSA using an adherence threshold of a minimum of 6 hours of PAP use per night for 100% of nights.

Methods: The study prospectively recruited children aged 4-18 years old who were prescribed PAP therapy at SickKids. Detailed PAP adherence data was obtained directly from PAP machines. PAP therapy utilization and adherence was analyzed using descriptive statistics.

Results: A total of 150 children were included, (median age = 14.0 years, females = 38.7%). Using a criteria of >4 hours of PAP use for at least 70% of nights, 74/150 (49.3%) of children were considered adherent. When applying our proposed >6 hours of PAP use for 100% of nights, only 33/150 (22.0%) met the criteria for PAP adherence.

Conclusion: Our data reveals that a significant portion of children do not meet the threshold of 6 hours of PAP use for 100% of nights, emphasizing the need for a revised definition that reflects the unique sleep requirements of children. This data also highlights an urgent need for alternative, efficacious therapies for OSA as a significant number of children are not adherent to PAP therapy.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

47 The Effect of Delaying School Start in Adolescence : A Control Trial With Actigraphy in a French Boarding School.

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 1

Abstract | Résumé

Introduction

A delay in sleep phase is commonly observed during adolescence. However, early school start times compel many teenagers to wake up early, resulting in sleep debt. Approximately 15 longitudinal studies have investigated the effects of delaying school start times, but none included a control group and objective sleep measures.

Method

This study was conducted at a French boarding school. During the first trimester (September to late October), all classes started at 8a.m. Subsequently, classes were randomized by grade: half continued with an 8a.m. start time ("8a.m." Group), while the other half began at 9a.m. ("9a.m." Group) from November to the end of the school year. Participants' sleep was assessed using actigraphy for two weeks, once in October (T0) and again in March (T1). Out of 96 students enrolled in the 7th and 8th grades, 86 agreed to participate, 20 were excluded due to insufficient actigraphy data (<3 days) at T0 or T1. Mage=12.8 years [11.7-14.2] at T0, 66% girls. All statistical tests were non-parametric.

Results

At T0, on school nights, participants' mean sleep onset time (SOT) was 21:50 (SD=0:17) and total sleep duration (TST) was 07:18 (SD = 0:26). At T1, both groups had equivalent SOT on school nights (8a.m. group: 22:06 (SD=0:26) vs. 9a.m. group: 21:57 (SD=0:29), $p=0.263$). The 8a.m. group slept 7:01 (SD=0:31) compared to 7:32 (SD = 0:26) for the 9a.m. group ($p<0.001$). The 8a.m. group reduced their sleep duration by 12 minutes (SD=36) between T0 and T1 ($p=0.044$), while the 9a.m. group increased their sleep duration by 10 minutes (SD=27) (difference between T1 and T0 comparison between groups $p=0.002$).

Conclusion

Delaying school start times did not delay SOT but effectively increased objectively measured sleep duration on school nights. This delay helped compensate for the natural decrease in sleep duration typically experienced by adolescents.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

54 Development and Preliminary Validation of the Pediatric Behavioural Sleep Knowledge Questionnaire and the Sleep, Attitudes, and Beliefs Scale for Multidisciplinary Healthcare Providers

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 1

Abstract | Résumé

Background. Despite the high prevalence of sleep concerns in families, HCPs receive very little formal and/or consistent training in pediatric sleep. Further, it is difficult to accurately understand HCPs' pediatric sleep knowledge, attitudes, and beliefs due to a lack of well-developed, validated measures. While some measures do exist, they are primarily discipline-specific (e.g., for psychology or medicine); therefore, they are not appropriate for use in introductory, multidisciplinary programs for pediatric sleep. To fill this gap, the investigators are developing and validating two measures to assess multidisciplinary HCPs' sleep knowledge, attitudes, and beliefs.

Methods. The Pediatric Behavioural Sleep Knowledge Questionnaire – Early Childhood and the Sleep Attitudes and Beliefs Scale – Healthcare Provider measures were developed based on previously published core pediatric sleep competencies for HCPs. Face and content validity for both measures were established through consultation with experts in early childhood sleep and people with lived experience. Beginning in November 2024, the investigators will recruit 100 licensed HCPs to complete both questionnaires at two timepoints (one month apart). Psychometric properties will be assessed, including construct validity, internal consistency, and test-retest reliability using 3-PL item response theory, exploratory factor analysis, confirmatory factor analysis, and correlations.

Results. Initial face and content validity assessments suggest that the measures include relevant, important, and understandable items to measure multiple core competencies of HCP sleep knowledge, attitudes, and beliefs. Preliminary psychometric results will be available by February 2025.

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Conclusion. These new measures can be used to evaluate professional development programs in pediatric sleep by measuring important outcomes, such as HCP sleep knowledge, attitudes, and beliefs. For example, the investigators will use these newly developed measures to evaluate the *Promoting Healthy Sleep for Early Childhood* online training program for HCPs. Furthermore, these measures will be applicable for multidisciplinary use, a unique characteristic compared to other measures.

Submission Category | Catégoire de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

90 Bedtime Medication in Autistic, ADHD Children and Adolescents Referred to a Pedopsychiatric Sleep Clinic

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 1

Abstract | Résumé

The prevalence of sleep disorders in children and adolescents with a psychiatric diagnosis is as high as 80%. Data on sleep medication use in this group of patients is limited. We reviewed the clinical files 278 patients aged 4-17 years old (mean: 10.3 ± 3.6; 196 boys, 82 girls) and diagnosed with ASD or ADHD upon admission to a pedopsychiatric sleep clinic. ADHD children were mostly of the hyperactive/impulsive type (156/167: 93.4%).

Bedtime medication and polysomnographic data were computed. Prescribed bedtime medication included antipsychotics (5.0% of the whole sample), alpha-adrenergics (4.0%), antidepressants (3.2%), benzodiazepines (0.7%), Z drugs (0.4%) and psychostimulants (none). Over-the-counter medications were melatonin (43.0%) and antihistaminergics (1.0%). Parents (n=131) filled the Children's Sleep Habits Questionnaire (CSHQ): 91.4% of the total scores exceeded the clinical cutoff of 41. There were no differences between ASD and ADHD groups, for the total score as well as for each of the eight subscales.

Polysomnography results were compared between 30 ASD (aged 10.2 ± 4.9 years) and 118 ADHD (aged 9.9 ± 8.7 years) patients. The only macrostructural difference was more stage N1 sleep % (mean ± SD) in the ADHD group (7.6 ± 8.7 vs 5.9 ± 3.3, p<0.005). The following markers of sleep instability were higher in the ADHD group: number of micro-arousals (50.8 ± 25.0 vs 39.5 ± 20.8,

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p<0.01), periodic movements in sleep index (16.8 ± 15.2 vs 10.1 ± 8.8 , p<0.002) and apnea index (4.8 ± 5.4 vs 2.1 ± 1.6 , p<0.001). Bedtime medication apparently did not contribute to these differences.

Bedtime medication was not as frequent as expected. On one hand, this is good news for a pediatric sample but on the other hand, access to behavioral and cognitive interventions is desperately limited in Canada. PSG recordings show that few differences distinguished ASD from ADHD youth.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

129 Frequency and Determinants of Non-Application of Infant Sleeping Recommendations at 2 Months in French Overseas Territories Using Data From the ENP-DROM 2021 Survey

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 1

Abstract | Résumé

Objectives: Preliminary analysis of the 2021 French National Perinatal Survey (ENP) suggest some poorer neonatal indicators in French overseas departments and regions (DROM) in comparison to metropolitan France, particularly regarding the application of newborns' sleep recommendations. We sought to estimate the frequency and identify the determinants of the non-application of the recommendation to put infant to sleep on their backs (NAR_BackSleep), the main protective factor against sudden unexpected infant death syndrome (SUDI), in the DROM.

Methods: Our study included participating mothers at baseline and 2 months follow-up of the ENP-DROM 2021 survey in Guadeloupe (n=361), Martinique (n=374) and Réunion (n=517). NAR_BackSleep was computed as yes/no using the child dorsal sleep position question asked at 2 months. For each DROM, adjusted prevalence ratios (PRa) of NAR_BackSleep were estimated by robust variance Poisson regressions on weighted data after imputation of missing data.

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Results: The frequencies of NAR_BackSleep were 58.7%, 47.1% and 24.2% in Martinique, Guadeloupe and Réunion, respectively. Common determinants of increased PRa of NAR_BackSleep were young maternal age (in all DROM), and lack of advice received from a health practitioner on newborns' sleep position (in Martinique and Réunion). Higher PRa of NAR_BackSleep were also observed with lower maternal education and health literacy, greater precariousness and inappropriate birth weight in Guadeloupe; with having a female child and presence of maternal post-partum depression in Martinique and with maternal feeling to be at ease financially and sharing their bed with their child in Réunion.

Conclusion: High frequencies of non-application of the recommendation to put infant to sleep on their backs have been measured in French overseas departments and regions. The identification of common and specific determinants in each territory will enable us to strengthen perinatal promotion among specific populations in these territories to prevent SUDI.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

167 The Association Between Chronotype and Positive Airway Pressure Adherence in Children

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 1

Abstract | Résumé

Introduction: Positive airway pressure (PAP) therapy is highly effective for the treatment of sleep-disordered breathing in children but is limited by poor adherence rates of less than 50%. Novel biological parameters such as chronotype, the preference of sleep-wake timing, may influence health-promoting behaviors that affect PAP adherence. We sought to examine the association between chronotype and PAP therapy adherence in children.

Methods: This is a cross-sectional study conducted at the Hospital for Sick Children (Toronto, Canada). Children and adolescents aged 4-18 years old prescribed PAP therapy for a minimum of six months were recruited. The primary exposure was caregiver-reported chronotype (morning, intermediate, or evening), defined by the Children's Chronotype Questionnaire. The primary

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outcome was average minutes of PAP therapy usage measured on a 180-day PAP download. The statistical analysis included Kruskal-Wallis rank-sum tests and multivariable quantile regression modeling.

Results: A total of 159 participants were included in the interim analysis (females = 48%, median age = 14.2 years, continuous PAP = 60%, median nightly sleep time = 534.3 minutes). There were 29/159 (18.2%) participants with a morning chronotype, 64/159 (40.3%) with an intermediate chronotype, and 66/159 (41.5%) with an evening chronotype. The median nightly usage of PAP was 436.0 (IQR 147.0, 516.0) minutes in the morning group, 417.0 (IQR 189.2, 538.8) minutes in the intermediate group, and 161.5 (IQR 6.0, 405.2) minutes in the evening group ($p=0.002$). The evening group used PAP for 264.4 (95% CI 391.7, 69.7) minutes less each night compared to the intermediate group adjusted for age and gender ($p=0.0031$). There was no difference in PAP adherence between the morning and intermediate groups.

Conclusions: We found that the evening chronotype is associated with reduced PAP adherence in children. Mechanisms for the association between chronotype and PAP adherence should be further studied to inform future targeted interventions.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

172 High Night-to-Night Variability in Childhood Obstructive Sleep Apnea Severity

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 1

Abstract | Résumé

Rationale: Overnight, attended, in-laboratory polysomnography (PSG) is the gold standard test for diagnosing childhood obstructive sleep apnea (OSA) and is heavily relied upon for treatment decision-making. The obstructive apnea-hypopnea index (OAHI) measured on the PSG is a common outcome measure in pediatric sleep research and is often utilized to determine research study eligibility. We sought to evaluate the test-retest reliability of the OAHI in children with moderate to severe OSA.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Methods: This is a secondary analysis of two pediatric trials evaluating alternative OSA therapies for children aged 4-18 years old with moderate to severe OSA on a baseline diagnostic PSG. The baseline diagnostic PSG data was compared to the PSGs from the inactive control arms of the trials. The intraclass correlation coefficient was determined for PSG parameters and Bland-Altman analyses were completed.

Results: Twenty-seven children were included (mean age 8 years, 41% females, median body mass index 24 kg/m²). The inter-test interval was 48 days (range: 14 – 78 days). The median OAHIs on the first and second PSGs were 9.4 events/hour and 14.2 events/hour, respectively, with weak correlation (intraclass correlation coefficient 0.303; 95% CI -0.064, 0.604; p=0.0518). The change in OAI from night-to-night was > 5 events/hour in 16/27 children (59%) and > 10 events/hour in 8/27 children (30%). Amongst the children with moderate OSA on the first night PSG, 5/15 (33%) had mild or no OSA on the second PSG. Amongst the children with severe OSA on the first night PSG, 2/12 (17%) had mild or no OSA on the second PSG.

Conclusions: The OAI measured on a PSG demonstrates poor test-retest reliability in children with moderate to severe OSA. The diagnosis of OSA in children should not solely rely on the OAI from a single night PSG. Further evaluation of night-to-night variability in children is required.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

176 Psychiatric Admissions of Children and Adolescents with Depression Across Periods Daylight-Saving Transitions: a Follow-up Study

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 1

Abstract | Résumé

Objectives: This study further examines fluctuations in admissions to a child and adolescent inpatient psychiatry unit in relation to time change transitions in and out of Daylight-Saving Time (DST) to Standard time (ST).

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Methods: Ten years (2012-2022) of youth inpatient admissions with a diagnostic of depression to a pediatric hospital in Ontario, Canada were retrieved (n=1804, 70 percent females). Statistical analyses compared admissions 15 days before and after time changes.

Results: When compared to pre-time change to post-time changes, admission rates did not change after the spring change to DST but were significantly higher after the return to ST for both genders during the fall ($p < .01$).

Conclusions: The absence of change in admission rates at the spring transition to DST is likely attributed to the fact that it corresponds with the one week school break in the spring. This break may compensate for the one hour loss in sleep opportunity as well as the biological clock adjustment. The significant increase in admission rates at the fall transition to ST seems to be related to the disruption of the biological clock and the depressive effect of sudden darkness one hour earlier in the day, which has been found to be associated with seasonal depression. It is consistent with earlier findings that the practice of DST has negative effects on mental health. It also supports eliminating the practice of DST or limiting the period to within the spring and fall equinoxes.

Submission Category | Catégorie de soumission

Sleep, dreams and mental health | Sommeil, rêves et santé mentale

193 To Meet or Not to Meet the NSF Recommendation for Total Sleep Duration at 6 Months: Preliminary Results on the Associations With Sleep Patterns at 6 and 12 Months

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 1

Abstract | Résumé

Introduction:

The development of sleep patterns in infancy is an important concern for new parents. The National Sleep Foundation (NSF) recommends 12 to 15 hours of total sleep duration for infants. However, few studies investigated the association between early infant sleep patterns and future sleep patterns, especially using objective methods. This preliminary study aimed to concurrently and longitudinally assess whether reaching the minimal 12-hour NSF's recommendation at 6 months was associated with specific sleep patterns at 6 and 12 months.

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Methods:

Infants' sleep ($N=17$) was recorded with actigraphy (over 7-14 days) at 6 and 12 months. At 6 months, the mean total sleep duration (including nighttime and daytime) was calculated, and infants were divided into 2 groups: those reaching the 12-hour total sleep duration at 6 months and those not. Nocturnal sleep duration (8pm-8am), Wake After Sleep Onset (WASO), number and duration of daily naps were compared between groups, at 6 and 12 months old with independent sample t -tests.

Results:

At 6 months old, 9 infants (53%) reached the NSF's recommendation of 12 hours of sleep daily. Infants reaching this criterion had longer nap durations at 6 months (206.0 ± 31.8 min) than infants who did not (138.0 ± 34.7 min; $p=0.001$), yet their nocturnal sleep duration, WASO, and the number of naps were not significantly different ($p>0.05$). No sleep variables were significantly different between groups at 12 months ($p>0.05$).

Conclusion:

Nap duration but not nocturnal sleep duration, was significantly longer for infants reaching the NSF's recommendation at 6 months, suggesting that naps contribute to reaching this recommendation. Promoting longer daytime naps in early infancy may help to increase total sleep duration. However, whether infants meet the 12-hour recommendation at 6 months was not associated with their sleep patterns at 12 months, emphasizing the developmental and evolving characteristics of sleep patterns in early infancy.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

ORAL SESSION 2: SLEEP, AGING AND NEURODEGENERATION

6 Prediction of Phenoconversion in Isolated REM Sleep Behavior Disorder Using Free Water Imaging: A Longitudinal, Multicentre, Prospective Cohort Study.

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 2

Abstract | Résumé

Background: Isolated REM sleep behavior disorder (iRBD) is the early manifestation most strongly associated with the development of synucleinopathies, as over 90% of patients eventually develop dementia with Lewy bodies (DLB) or Parkinson's disease (PD). However, there is currently a lack of validated biomarkers to predict disease progression, particularly the progression to DLB compared to PD.

Free water (FW) in the basal forebrain and substantia nigra is a diffusion MRI-based marker that has proven efficient to detect increases in neuroinflammation and predict disease progression in neurodegenerative diseases. However, it has never been robustly validated in iRBD.

Methods: A total of 438 participants (261 iRBD patients, 177 controls), underwent diffusion-weighted imaging scans. Of these, 230 patients had longitudinal follow-up data, with 64 converting to a neurodegenerative disease and 166 remaining disease-free. FW fractions were calculated using the FreeWater Flow pipeline and extracted from the left and right basal forebrain (BF), and posterior substantia nigra (pSN). Logistic regressions assessed how FW relates to odds of phenoconversion and Cox regressions assessed how it associated with reduced survival (disease-free), adjusting for age and sex.

Results: When iRBD patients were stratified based on phenoconversion status, significant differences emerged, contrary to when comparing iRBD patients to controls. Patients who converted to a disease exhibited increased FW values in the left and right BF and the left pSN compared to those who remained disease-free. Importantly, increased FW values in the BF were significantly associated with the odds and risk of development of DLB in iRBD compared to PD.

Conclusion: FW in the basal forebrain is associated with the development of dementia with Lewy bodies in iRBD.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

14 Sex Effect on Cortical Neurodegeneration Associated With Isolated REM Behavior Disorder

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 2

Abstract | Résumé

Background

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Isolated REM behavior disorder (iRBD) is the early manifestation most strongly associated with the development of synucleinopathies, such as dementia with Lewy bodies and Parkinson's disease. This sleep disorder, occurring mostly in males, is characterized by muscle atonia loss, leading to abnormal movements during REM sleep. Individuals with iRBD already exhibit brain atrophy shaped by distinct gene expression, although sex-specific differences in structural brain changes remain unclear. The objective of this study was to investigate, for the first time, the effect of sex on brain atrophy in iRBD and examine the gene expression underpinning the brain abnormalities in people with polysomnography-confirmed iRBD.

Methods

A total of 890 individuals underwent brain MRI acquisition (T1-weighted), including 409 individuals with iRBD and 481 healthy controls. Vertex-based cortical surface reconstruction and segmentation were conducted using FreeSurfer. General linear models were used vertex-wise to quantify brain atrophy and assess the sex effect on cortical thickness in iRBD compared to controls, while controlling for age. Clusters were considered significant when $P < 0.05$ after Monte Carlo permutations. Cortical data was parcellated, corrected for age and acquisition site, and gene expression was extracted from the same parcellation. Gene enrichment analyses were conducted to identify genes associated with the sex-driven differences in cortical atrophy in iRBD.

Results

Cortical thinning was found in males compared to females with iRBD and healthy controls in left postcentral and superior frontal regions, and in right precentral and paracentral regions. The gene enrichment analysis revealed significant gene enrichment in females with iRBD only, where estrogen related receptors were over-expressed in atrophied regions.

Conclusion

These new findings suggest distinct differences in brain atrophy between male and female individuals with iRBD, including specific gene expression underlying the sex effect patterns in the brain. These results emphasise the need for developing sex-specific neuroprotective treatments during the prodromal stages of synucleinopathies.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

21 Brain Connectivity Alterations in Idiopathic REM Sleep Behavior Disorder: A Multi-Cohort Study

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 2

Abstract | Résumé

Isolated REM sleep behavior disorder (iRBD) is a parasomnia characterized by abnormal dream enactment behaviors during REM sleep. It is strongly associated with the development of Parkinson's disease (PD) and dementia with Lewy bodies (DLB) and therefore represents a critical window for understanding early neurodegeneration. While brain structural connectivity is known to be disrupted in PD and DLB, its alteration in iRBD remains unclear.

Here we used Diffusion-Weighted brain Imaging data from 198 polysomnography-confirmed iRBD patients and 174 controls recruited as part of a large international multicentric study combining seven sites. We generated the structural connectivity maps between 448 cortical and 14 subcortical regions and applied network-based statistics to quantify the presence of changes in connectivity between groups. Global and local network efficiency were computed and differences were tested between groups. Correlations were also examined between global and local network efficiencies and network-derived metrics including clustering coefficient, connection strength, and node degree.

We found that connectivity strength was decreased in iRBD patients compared to controls, particularly in the putamen and multiple cortical areas across the brain. A few connections in the parietal, frontal, and insular cortices showed increased strength in iRBD. Global and local network efficiencies were reduced in iRBD, particularly in the putamen, thalamus, insula, and parts of the parietal, temporal and frontal cortices. Moreover, a positive relationship between local efficiency and clustering coefficient as well as negative correlations with connection strength and degree were observed ($p\text{-value}_{\text{spin-FDR}} = 0.001$).

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These findings highlight the presence of early changes in brain structural connectivity in iRBD, providing insights into the neurodegeneration preceding DLB and PD.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

31 Increased Free Water in the Amygdala as Biomarkers of Disease Progression in Isolated REM Sleep Behavior Disorder.

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 2

Abstract | Résumé

Current neuroimaging tools enable us to identify biomarkers that can predict the evolution of dementia. Markers of neuroinflammation derived from Free Water (FW) Imaging appear to be promising predictive metrics. However, their ability to predict disease progression in isolated rapid eye movement sleep behavior disorder (iRBD) remains poorly understood. Here we investigated 407 participants with MRI scans acquired as part of a multicentric study, including 177 healthy controls (CTL), 166 iRBD who did not convert (RBDnc) and 64 iRBD who did convert to a synucleinopathy (RBDc). We extracted gray matter volume (GMV) and FW within subcortical

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structures, namely the putamen, caudate, hippocampus, and amygdala. Data were normalized for site effects and general linear models were used to assess group effects with age and sex as covariates. Correlation between FW, cognition and parkinsonian features were also analyzed. GMV results indicated significant group effects for the amygdala, putamen, and left hippocampus (all $p \leq 0.025$). Post-hoc comparisons revealed GMV decreased in the amygdala and left hippocampus in RBDc as compared to CTL and RBDnc. Larger GMV was found in the putamen in CTL as compared to RBDc and RBDnc, but did not differ between patients. In terms of FW, group effects were found in the bilateral amygdala with higher FW in RBDc as compared to RBDnc and CTL (all $p \leq 0.002$). A significant positive correlation between amygdala-FW and UPDRS-III, and a negative correlation with the MoCA were found in RBDc only. These results demonstrate the presence of significant atrophy and inflammation within the subcortical structures of iRBD individuals, particularly in relation to disease progression.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

60 Associations Between Brain Cholinergic Denervation and Rapid Eye Movement Sleep EEG in Older Adults With and Without Cognitive Impairment

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 2

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Abstract | Résumé

Introduction: Rapid eye movement (REM) sleep is altered in patients with Mild Cognitive Impairment (MCI) and Alzheimer's disease (AD), who notably exhibit a global slowing of REM sleep EEG rhythms and reduced REM sleep duration compared to healthy controls. Brain cholinergic denervation has also been largely described as a function of AD severity. As REM sleep is highly dependent on cholinergic activity, we investigated the long-standing hypothesis that cholinergic denervation is associated with REM sleep characteristics in older adults.

Methods: Eighteen cognitively normal and six amnesic MCI participants without sleep apnea (mean age: 71.3 ± 4.9 years; 14 women, 10 men) underwent one night of in-laboratory polysomnography, a full cognitive assessment, a structural MRI and a molecular PET imaging with [^{18}F]-Fluoroethoxybenzovesamicol ([^{18}F]-FEOBV), a sensitive measurement of the brain cholinergic innervation density. We computed REM sleep proportion (expressed as a percentage of total sleep time), mean absolute theta power (4-8 Hz), and REM sleep EEG slowing ratio, defined as $(\delta + \theta)/(\alpha + \beta)$ power, on T3-T4, P3-P4 and F3-F4 derivations. Whole-brain voxel-wise multiple regressions were conducted between REM sleep characteristics and FEOBV-PET standard uptake values ratios maps corrected for partial volume effects in the whole sample. Analyses were controlled for sex, as cholinergic uptake was higher in women than in men.

Results: REM sleep EEG slowing over frontal and parietal derivations was negatively associated with cortical cholinergic denervation, notably in fronto-parietal areas and the medial temporal lobe ($p < 0.005$ level, combined with a cluster-level FWE correction). There was no significant association with REM sleep percentage or theta power.

Conclusions: In older adults without dementia, cholinergic denervation was significantly associated with greater REM sleep EEG slowing. These results suggest that quantitative REM sleep EEG could be an early marker of the dysfunction of the cholinergic system, before the onset of dementia.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

83 Sleep Quality and Variability and β -Amyloid Pathology Among Cognitively Unimpaired Older Adults

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 2

Abstract | Résumé

Sleep disorders are increasingly recognized as a risk factor for Alzheimer's disease, primarily by facilitating cerebral accumulation of β -amyloid peptide ($A\beta$). However, the specific aspects of sleep that should be prioritized to promote healthy aging remain debated. This study aims at identifying the sleep characteristics associated with amyloid accumulation, taking into account the intra-individual variability of these characteristics across nights.

Sleep was monitored at home for 3 to 7 nights in 76 cognitively unimpaired elderly subjects (69 ± 3.41 years) enrolled in the Age-Well clinical trial, using Somno-Art®, a wearable device alternative to polysomnography, relying on heart rate and accelerometer data analysis. Cerebral amyloid deposition was measured by PET (18F-Florbetapir). ANCOVAs and post-hoc analyses were used to assess differences between the amyloid-positive ($A\beta+$, $n=22$) and amyloid-negative ($A\beta-$, $n=54$) groups for each sleep parameter. Whole-brain multiple regressions were then performed between amyloid load and sleep parameters that were significantly different between groups. All analyses were adjusted for age, sex, education level, APOE- $\epsilon 4$ status and apnea-hypopnea index.

The $A\beta-$ group showed significantly longer total sleep time, as well as greater non-rapid eye movement (NREM) and N2 sleep durations ($p<.05$). Each of these sleep parameters was negatively correlated with amyloid load in temporal, parietal and occipital regions ($p<.001$). The $A\beta+$ group showed higher variability in REM sleep duration ($p=.019$) and NREM sleep percentage ($p=.036$). These parameters positively correlated with amyloid deposition in frontal, temporal, parietal and occipital regions ($p<.001$).

This study highlights the need to consider both mean values and variability of sleep parameters when addressing the links between sleep quality and amyloid pathology. It demonstrates the importance of longer total sleep and stable NREM sleep in reducing amyloid accumulation, while variability in REM sleep may exacerbate risk. Targeting sleep quality could be crucial in mitigating Alzheimer's disease risk and promoting healthy aging.

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Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

106 Altérations Des Gradients De Connectivité Anatomique Dans Le Trouble Comportemental Du Sommeil Paradoxal Isolé

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 2

Abstract | Résumé

Le trouble comportemental en sommeil paradoxal isolé (TCSPi) est une parasomnie caractérisée par la perte d'atonie musculaire en sommeil paradoxal et l'apparition de mouvements anormaux, souvent agressifs, pendant les rêves. Plus de 90% des personnes avec un TCSPi développeront la maladie de Parkinson ou la démence à corps de Lewy (DCL). L'étude des altérations cérébrales associées au TCSPi représente une façon de comprendre les mécanismes du développement de la maladie de Parkinson et de la DCL. Or, nous avons une compréhension très limitée des changements cérébraux associés au TCSPi, notamment sur l'organisation de la matière blanche dans le cerveau.

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Dans cette étude, nous avons recruté 198 personnes avec un TCSPi confirmé par vidéo-polysomnographie et 121 contrôles sains pour passer une IRM cérébrale et acquérir des images de diffusion. Des analyses de tractographie des scans ont permis d'obtenir une matrice de connectivité par personne représentant les connexions entre 462 régions. Une méthode de réduction de dimensionnalité a été appliquée sur les matrices avec BrainSpace afin d'identifier les gradients de connectivité anatomique en regroupant les régions avec une connectivité similaire. Des tests-t ont ensuite été utilisés pour comparer l'expression des gradients par région entre les deux groupes.

Nos résultats montrent la présence d'altérations dans les patrons de connexion interrégionale chez les personnes TCSPi. Au premier gradient de connectivité identifié, 15 régions présentaient une expression moins prononcée dans le TCSPi par rapport aux contrôles ($p < 0.05$), dont le gyrus précentral et le putamen. Les régions occipitales étant celles principalement décrites par ce gradient, ceci indique une diminution de similarité des patrons de connectivité de ces 17 régions par rapport aux régions occipitales.

Cette étude montre que l'organisation de la connectivité cérébrale est déjà altérée dans le TCSPi, suggérant que les atteintes de la matière blanche sont des manifestations précoces du développement des synucléinopathies.

Submission Category | Catégorie de soumission

Parasomnias | Parasomnies

149 The Interplay Between Orexin, Neurodegeneration, Cognition and Sleep Microarchitecture in Mild to Moderate Alzheimer's Disease

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 2

Abstract | Résumé

Cerebrospinal fluid (CSF) orexin levels are higher in MCI and AD and associated with sleep deterioration, increasing risk of cognitive decline and Alzheimer's disease (AD)

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progression. Orexin-A is a key sleep-wake cycle regulator. Dual orexin receptor antagonists improve sleep in AD and insomnia and may reduce tau and A β deposition in older adults. However, little research has investigated associations between sleep microarchitecture, orexin, neurodegeneration biomarkers, cognitive decline, or mental health in AD.

Methods: Using data from a prospective cohort study of mild-to-moderate AD (n=60, 30-female, mean age=74.7), we analysed non-REM sleep spindles, slow oscillations (SO), and their associations with CSF orexin, AD biomarkers, cognition, and mental health over three years. Participants underwent polysomnography (PSG) and CSF draws at baseline, neuropsychological assessment with the Alzheimer's Disease Assessment Scale-Cognitive Subscale (ADAS-Cog) and Neuropsychiatric Inventory (NPI) at baseline and 12 months, and Mini-Mental Status Examination (MMSE) at baseline, 12, 24, and 36 months.

We performed Spindle and SO detection with in-house, open-source software packages developed at Concordia University. Associations between SO and spindle characteristics (duration, density, power, amplitude) and orexin, A β 42 and tau at baseline, and baseline orexin and cognition from baseline to 36 months were investigated with false discovery rate-adjusted generalised linear models, controlling for age, sex, apnea-hypopnea index.

Results: We found previously unreported, predictive associations between SO, duration, density, amplitude, and CSF orexin. Orexin also predicted increased ptau181, total-tau, ptau/A β 42, total-tau/A β 42. Increased orexin predicted worse cognitive performance (higher ADAS-cog, lower MMSE) from baseline to 36-months and increased neuropsychiatric symptom severity (NPI) from baseline to 12 months. Orexin also moderates relationships between spindles, SO, cognition, and mental health.

Conclusions: Orexin levels are associated with neurodegeneration biomarkers and cognitive deterioration in AD and moderate relationships between sleep microarchitecture and cognitive changes over time. Orexin may thus constitute a potential target for sleep-related interventions for cognition in neurodegenerative disorders.

Submission Category | Cat  gorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurod  g  nescence

154 Sleep Spindles and Slow Oscillations Predict Neurofilament-Light, Neurogranin 36, Chitinase-3-Like Protein-1 and Cognition in Mild to Moderate Alzheimer's Disease.

Dr. Arsenio Paez^{1,2,3}, Ms. Shahla Bakian Dogaheh⁴, Mr. Sam Gillman⁵, Dr. Anna Carnes⁶, Dr. Faride Dakterzada⁶, Dr. Ferran Barb  ⁷, Dr. Thanh Thien Dang-Vu^{5,2}, Dr. Gerard Pi  ol Ripoll⁶

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 2

Abstract | Résumé

Introduction: Sleep is essential for brain-health, including clearance of β -amyloid ($A\beta$), tau, and other promising diagnostic markers of neurodegeneration and progression in Alzheimer's Disease (AD): cerebrospinal fluid neurofilament-light chain (NfL), neurogranin-36 (NG-36), and Chitinase-3-like protein-1 (YKL-40). However, it remains unclear which sleep characteristics predict these biomarkers or whether the biomarkers predict cognitive or neuropsychiatric decline after AD onset.

Methods: Using data from a prospective cohort study of mild-to-moderate AD (n=60, 30-female, mean age 74.7), we analysed non-rapid eye-movement sleep spindles and slow oscillations (SO) at baseline and their associations with baseline NfL, YKL-40, NG-36, NfL/ $A\beta$ 42, YKL-40/ $A\beta$ 42, and whether these biomarkers predict cognition and mental health from baseline to three-years follow-up.

Participants underwent baseline polysomnography (PSG) and cerebrospinal fluid draws for amyloid and tau, and neuropsychological assessment at baseline, 12, 24 and 36 months with the Mini-Mental Status Examination (MMSE), and the Alzheimer's Disease Assessment

Scale-Cognitive Subscale (ADAS-Cog) and Neuropsychiatric Inventory (NPI) at baseline and 12 months.

Spindle and SO detection were performed using in-house, open-source software packages developed at Concordia University. Associations between SO and spindle characteristics (duration, density, power, amplitude), biomarkers, and cognition from baseline to 36 months were investigated with false discovery rate-adjusted robust regression controlling for age, sex, apnea-hypopnea index.

Results: We found previously unreported associations between spindle and SO characteristics, NfL, YKL-40, NG-36, NfL/ $A\beta$ 42, YKL-40/ $A\beta$ 42, and cognition in persons with AD. Higher spindle and SO activity predicted significant changes in biomarkers, and these predicted worse cognitive performance (higher ADAS-cog and lower MMSE scores) from baseline to 36-months, along with a significant increase in neuropsychiatric symptom severity (NPI β =16.93 p <0.001).

Conclusions: Our novel findings demonstrate that spindle and SO activity are associated with NfL, YKL-40, and NG-36, and cognitive decline, constituting predictive, non-invasive biomarkers of neurodegeneration, cognition, and mental health in AD. They may thus provide novel treatment targets for delaying AD progression.

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Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

194 The Effects of Age and Sleep on Anxiety and Stress Within the Context of the COVID-19 Pandemic

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 2

Abstract | Résumé

Background

Sleep plays an important role in mental well-being and healthy aging, but sleep challenges manifest differently across the lifespan. Sleep and mental health have a bi-directional relationship, but little is known about how this relationship may vary across ages. This project examines the relationship between sleep and mental health outcomes in response to an external stressor across various age groups.

Methods

Online survey data collected during the early phases of the COVID-19 pandemic (April-June 2020) from 2,089 individuals between the ages 20-95 years old (Mean \pm SD = 55.6 \pm 16.3 years, 67% females) was analyzed. Measures of interest within the survey were the Perceived Stress Scale (PSS), Pittsburgh Sleep Quality Index, and Generalized Anxiety Disorder 7 (GAD-7) questionnaire.

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Results

A significant interaction showed that sleep quality was worse during the pandemic relative to pre-pandemic estimates, but this effect was more pronounced in younger adults (20-39 years old) compared to older adults (40+ years old; $F=3.7$, $p=.002$, $\eta^2=.009$). Similar interactions showed that although PSS and GAD-7 scores were higher during the pandemic across all age groups, the magnitude of this effect progressively decreased with advancing age ($F \geq 10.4$, $p < .001$, $\eta^2 \geq .021$). Furthermore, for all age groups, worsening GAD-7 scores were significantly higher in the subgroup whose sleep worsened during the pandemic compared to the group whose sleep did not change, but the magnitude of this effect decreased with increasing age ($F=2.3$, $p=.045$, $\eta^2=.006$).

Conclusion

Although older adults experience sleep alterations, they may develop resilience and coping mechanisms that protect their sleep patterns and mental health in the face of external stressors. Younger groups may benefit from extra sleep and stress support resources during global crises. These findings can help develop tailored strategies to support different age groups' sleep and mental well-being well before another worldwide emergency potentially unfolds.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

ORAL SESSION 3: INSOMNIA

7 Daridorexant Is Safe and Improves Both Sleep and Daytime Functioning in Elderly Patients With Insomnia

Ingo Fietze¹, Claudio Bassetti², David Mayleben³, Alberto Gimona⁴, Scott Pain⁴, Dalma Seboek Kinter⁴, Meryem Maoui⁵, Jonathan Charest⁵, Marc Veronneau⁵

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 3

Abstract | Résumé

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Introduction

Insomnia affects more the elderly, with more prevalent comorbidities that can add to symptom burden and reduce therapeutic options. Insomnia drugs with limited safety risks are needed in this group. We report elderly subgroup analyses from a Phase-3 trial with daridorexant.

Methods

Analyses by age (≥ 65 years, $n = 364$; < 65 years, $n = 566$) were performed from the randomized, double-blind, placebo-controlled Trial data in adult patients with insomnia (NCT03545191). Randomized patients (1:1:1) received daridorexant 25mg, 50mg or placebo nightly for 3 months. Month 3 endpoints were: change from baseline in polysomnography-measured wake-after-sleep-onset (WASO) and latency-to-persistent-sleep (LPS), subjective total sleep time (sTST), and daytime functioning (Insomnia Daytime Symptoms and Impacts Questionnaire [IDSIQ] – sleepiness domain; lower scores = improvement). Safety endpoints included treatment emergent adverse events (TEAE), AEs of special interest (AESI) and withdrawal effects upon treatment cessation.

Results

364 (39.1%) patients ≥ 65 y were randomized: 25mg ($n=121$), 50mg ($n=121$) and placebo ($n=122$). In this subgroup, at Month 3, the placebo-corrected least-square mean of change from baseline [95%CI] for daridorexant 25mg and 50mg were: WASO -17.0[-27.0,-7.0] and -19.6[-29.5,-9.7] mins; LPS -7.8[-15.2,-0.4] and -14.9[-22.3,-7.5] mins; sTST 18.7[4.1,33.2] and 30.6[16.1,45.2] mins; IDSIQ sleepiness domain -0.6[-2.2,0.9] and -2.6[-4.1,-1.0], all respectively.

In the respective 25mg, 50mg and placebo groups of patients ≥ 65 y, TEAEs were reported in 32.2%, 35.3%, and 31.1%. Falls ($n=1,1,4$) and dizziness ($n=4,1,1$), were least frequent in the 50mg group. Compared to placebo, somnolence was as frequent for 50mg daridorexant ($n=6,1,1$) while fatigue was more frequent in both daridorexant groups ($n=4,3,1$); incidence did not appear dose-related. AESI, of mild intensity, were reported in 2 patients (one in each daridorexant group). There was no evidence of withdrawal symptoms.

Conclusions

Daridorexant is efficacious in the elderly population for improvements in sleep and daytime functioning. No safety concerns in this vulnerable population were identified.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

8 Nighttime Safety of Daridorexant: Response to Noise Stimuli, and Effects on Postural Stability, Walking and Memory

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 3

Abstract | Résumé

Introduction: Daridorexant is a dual orexin receptor antagonist approved for the treatment of adult patients with insomnia disorder. Following single-dose administration at bedtime to healthy subjects, pharmacodynamics (PD) and safety were investigated in the middle of the night (MOTN) after forced awakening to a noise stimulus.

Methods: Double-blind, placebo-controlled, randomized, 3-way crossover study (placebo, 25, and 50mg daridorexant in the evening) in 36 non-elderly and elderly subjects (1:1 ratio). Four hours after bedtime administration, the auditory awakening threshold (AAT) was determined (increasing noise signal up to 100 dB). Next, the main PD endpoint postural stability (body sway) as well as basic functional mobility (Timed Up and Go (TUG) test), and cognitive function/memory using the Visual Verbal Learning Test (VVL) were assessed.

Results: All subjects completed the study. The average AAT was approximately 60 dB with no differences between daridorexant and placebo. Body sway showed a small, dose-dependent increase vs placebo with differences in least square means (LSM) 95% confidence interval (CI) of 36.7 (2, 71) and 65.9 (31, 100) mm, for daridorexant 25 and 50 mg, respectively. The overall increased body sway was driven by non-elderly subjects, as effects in elderly were similar to placebo. Subjects completed the TUG test in 6–8 s across treatments, with a small, dose-dependent increase vs placebo with a difference in LSM (95% CI) of 0.14 (0.02, 0.27) and 0.47 (0.34, 0.59) s for daridorexant 25 and 50 mg, respectively. The VVL (immediate and delayed number of recalled words) showed minimal differences to placebo (≤ 1 word) word for daridorexant 25 and 50 mg. During delayed word recognition, subjects correctly recognized 77–79% words across treatments with no difference to placebo for either daridorexant dose.

Conclusion: Following bedtime administration, daridorexant preserved the ability to respond to external noise stimuli and subjects were able to operate safely during the night.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

11 Efficacy and Safety of Daridorexant in Patients With Chronic Insomnia Disorder and Comorbid Nocturia

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 3

Abstract | Résumé

Introduction Chronic insomnia and nocturia are frequently associated. Insomnia and nocturnal voids ≥ 2 /night significantly impact sleep quality, daytime functioning and quality of life. This study evaluated effects of daridorexant in patients with insomnia and comorbid nocturia.

Methods This double-blind, placebo-controlled, two-way cross-over study randomised 60 patients aged ≥ 55 years with chronic insomnia (insomnia ≥ 3 months; insomnia severity index [ISI] score ≥ 13) and self-reported nocturia (≥ 3 voids/night for ≥ 1 month) to 4-weeks nightly treatment of daridorexant 50mg or placebo. A 14–21-day washout period followed, then patients received the alternate 4-week treatment. The primary endpoint was change from baseline to Week 4 in self-reported total sleep time (sTST). Other endpoints included change from baseline in ISI score, sTST, depth of sleep (visual analogue scale) and daytime functioning (Insomnia Daytime symptoms and Impacts Questionnaire [IDSIQ] total score). Nocturia endpoints, evaluated using the Minze diary Pod, included change from baseline in number and time to first nocturnal void. Safety endpoints included adverse events (AEs) and AEs of special interest (AESI: falls, urinary incontinence).

Results Daridorexant (vs. placebo) significantly increased mean sTST (56.6 vs. 35.7 mins; $p=0.002$) at Week 4; significant improvements were seen from Week 1 (first timepoint). Daridorexant (vs. placebo) significantly ($p<0.05$) decreased ISI scores (Weeks 2, 4) and significantly ($p<0.05$) improved depth of sleep (Weeks 1-4) and IDSIQ total score (Weeks 1, 3). Daridorexant (vs. placebo) reduced the number of nocturnal voids (Week 1: -1.5 vs. -1.0, $p<0.001$; Week 4: -1.6 vs. -1.3, $p=0.09$) and increased median time to first nocturnal void (difference to placebo, Week 1: +31 mins, $p=0.0027$; Week 4: +23 mins, $p=0.2026$). No serious AEs/AEs leading to discontinuation were reported. No AESIs were reported during daridorexant administration.

Conclusion In patients with insomnia and comorbid nocturia, daridorexant improves sleep, daytime functioning and nocturia symptoms, with no increased risk of falls or urinary incontinence.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

32 Acute Sleep Loss and Highway Hypnosis: One Night of Mild Sleep Restriction Leads to a Reduction in Visual Scanning and Environmental Processing Behaviours While Driving

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 3

Abstract | Résumé

Introduction: Sleep loss has a detrimental impact on cognition, including attention, working memory and decision-making. Driving is complex and cognitively demanding. Dangerous impairment in driving performance can occur following sleep loss. Much is known about the effects of severe and prolonged sleep deprivation on daytime performance. However, relatively little is known about the impact of the more common and insidious, mild and acute sleep loss. Here, we investigated the behavioural and physiological consequences of mild and acute sleep loss on objective vigilance during a prolonged driving simulation task. We hypothesized that sleep loss would be associated with reduced vigilance, impaired driving performance, and that certain oculomotor features would be physiological markers of drowsy driving.

Methods: Twenty-two participants (13 female, age 20-35, $M=24.6\pm4.6$) completed two 1-hour driving simulations in the lab where they were instructed to tailgate a lead vehicle, following either a night of normal sleep (9h) or sleep restriction (5h). Eye tracking data was categorized into two types of fixations: express fixations (0.50-250ms) and cognitive fixations (500-2000ms), representing scanning behaviours and meaningful/effortful processing, respectively.

Results: Following sleep restriction, participants were slower to brake in the driving simulator ($t(33)=3.05$, $p=0.005$) and experienced a greater number of crashes ($t(33)=3.00$, $p=0.006$). While driving, the rate of cognitive (but not express) scanning behaviours changed as a function of environmental context (tailgating vs. not) when normally rested, but not when sleep restricted ($F(1, 21)=4.41$, $p=0.048$).

Conclusion: These findings suggest that a single night of mild sleep restriction impacts fitness to drive, reflected by a contextual reduction of eye behaviours associated with meaningful processing of the environment. A better understanding of the cognitive, physiological, and behavioural markers associated with sleep loss may lead to important advancements in motor vehicle technologies to identify and prevent dangerous, sleep-related lapses in vigilance.

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Submission Category | Catégorie de soumission

Sleep and occupational health and safety | Sommeil et la santé et sécurité au travail

39 Exploring The Interaction of Biological Sex and Age on Spindle Characteristics in Chronic Insomnia and Healthy Sleep

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 3

Abstract | Résumé

Introduction: Sleep function generally declines with age, including spindle characteristics (SC) important for memory consolidation. While individuals with chronic insomnia (CI) frequently report cognitive difficulties, few studies have compared SC between CI and healthy sleepers (HS), and even fewer have considered the impact of biological sex and CI across the lifespan.

Methods: We analyzed one night of sleep in 241 adults aged 18 to 82 [125 CI (72% female, 46.79±14.82) and 116 HS (63% female, 33.23±16.90)]. Using PSG recordings with 24 scalp-EEG channels (Somnomedics, Germany), we automatically detected spindle density, count, duration, amplitude, and peak frequency in central channels (Lacourse methods). Multiple regressions assessed the effects of group, sex, and age on spindle characteristics. Additionally, 2x2 FANCOVAs with Welch's tests evaluated group, sex, and age interactions.

Results: In Fz, group, sex, and age explained 21-44% of the variance in SC. Mean spindle density was significantly higher in HS than in those with CI and interacted with age [$F_{\text{Welch}}(5,34.45)=17.98$, $p<.001$, $h^2=.40$], but it declined more steeply with age for HS. Females had higher mean spindle density than males [$F_{\text{Welch}}(5,68.77)=14.19$, $p<.001$, $h^2=.24$], but males experienced a sharper decline with age. A three-way interaction in group, sex, and age [$F_{\text{Welch}}(11,37.77)=10.44$, $p<.001$, $h^2=.38$] showed that female HS had the highest spindle density, followed by male HS, and both male and female CI. Overall HS had higher spindle density but males, irrespective of

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group, showed steeper declines across age . Similar trends were found in Pz and Cz, and for spindle count, but not for duration, amplitude, or peak frequency.

Conclusion: Biological sex and CI influence spindle density and count, with age modulating their decline in different groups across the lifespan. Future research should explore this three-way interaction in other neurophysiological sleep markers to identify potential treatment targets.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

64 Mirtazapine for Chronic Insomnia in Older Adults: A Randomized Double-Blind Placebo-Controlled Trial – The MIRAGE Study

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 3

Abstract | Résumé

Background

Mirtazapine promotes sleep by blocking serotonin and histaminergic receptors and is often used off-label to treat chronic insomnia. However, its efficacy remains to be demonstrated in a clinical trial. The MIRAGE study aims to determine the efficacy and safety of mirtazapine in older patients with chronic insomnia.

Methods

This was a double-blind, randomized, placebo-controlled trial in a geriatric outpatient clinic of a teaching hospital. Adults aged 65 years and older with chronic insomnia were included. Sixty participants were randomized in a 1:1 ratio to receive mirtazapine 7.5 mg or a matching placebo for 28 days. The primary efficacy endpoint was the mean change in the Insomnia Severity Index (ISI) score from baseline to 28 days post-treatment. The primary safety endpoints included any adverse

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events reported during the clinical trial and all adverse events leading to premature discontinuation.

Results

Mirtazapine was superior to placebo on the primary outcome measure, subjective wake after sleep onset, total sleep time, and sleep efficiency. After 28 days, the mean change in ISI score was significantly greater in the mirtazapine group (-6.5 [95%CI; -8.3 to -4.8]) compared to the placebo group (-2.9 [95%CI; -4.4 to -1.4]), with a p-value of 0.003). No participant experienced severe adverse events. A total of 6 participants in the mirtazapine group and 1 participant in the placebo group discontinued their treatment due to adverse events.

Conclusion

Mirtazapine reduces chronic insomnia symptoms in older people. However, its use may be limited by mild but clinically relevant adverse events. (clinicaltrials.gov NCT05247697)

Submission Category | Catégorie de soumission

Insomnia | Insomnie

108 Cortical Hyperactivation in Chronic Insomnia during An Associative Declarative Memory Task

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 3

Abstract | Résumé

Cognitive difficulties are often associated with chronic insomnia, but it remains unclear how the disorder influences memory. Here, we present preliminary data on the impact of chronic insomnia and cognitive behavioral therapy for insomnia (CBTi) on associative memory and related brain activity.

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Thirty-two participants with chronic insomnia (INS; DSM-V criteria) were randomly assigned to an individualized 8-session CBTi program (14 TX; 7F, 39±10.3 years) or a 3-month waitlist (18 WL; 10F, 41±10.1 years). They also underwent pre- and post-intervention evaluations (V1 and V2). Fourteen good sleepers (GS; 7F, 32±7.58 years) also completed a baseline assessment.

At each visit, participants memorized 80 faces associated with a first name in a 3T MRI (T2* sequence). Brain activity was computed using SPM12, and next-day recall accuracy was scored according to correct answers selected among three choices. ANCOVAs and regressions (Group and Visit factors; age and sex covariates) were conducted to compare INS and GS at V1, and TX and WL at V1 and V2.

No significant differences were observed in memory recall between INS and GS ($p=.912$). However, when correctly encoding face-name pairs, INS showed a more extensive activation pattern than GS in the orbitofrontal cortex (MNI coord.= 42,34,-6; $p_{\text{FWE-corr}}=.053$, $p_{\text{uncorr}}<.001$), extending to the hippocampus, occipital cortex and fusiform gyrus. No changes were found between V1 and V2 for either INS subgroups ($p>.05$). Additionally, although insomnia severity index (ISI) scores decreased significantly in TX, but not in WL ($F_{\text{Group*Session}}(1,30)=11.46$, $p<.001$), this reduction was not correlated with any outcome variable ($p_{\text{FWE-corr}}>.05$).

Higher cortical activity in the INS group compared with the GS group along with similar performance suggests the involvement of compensatory mechanisms. Thus, participants with insomnia might require more cortical resources than GS to achieve similar performance, which is not reversed immediately following a 3-month CBTi intervention.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

164 The Insomnia Disorder Health Quality Standard: A Coming of Age for Insomnia Care in Ontario

Dr. Colleen Carney

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 3

Abstract | Résumé

Health Ontario will release their long-awaited Insomnia Disorder Health Quality Standard early 2025. There has not been a quality standard for insomnia disorder in Ontario to date, and it is long overdue. Quality Standards define what high-quality care should look like for conditions or processes: 1) where there is significant variation in care delivery, or 2) where gaps exist between

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the current care in Ontario and the ideal care that patients should receive. This means that patients in Ontario will know the standard of care they should receive for insomnia. It also means that clinicians will learn what evidence-based, expert-recommended care they should be providing. This talk, provided by the Co-Chair of the Workgroup, will review the standard and discuss the provincial and national opportunities this standard could provide for increasing accessibility to evidence-based insomnia disorder care.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

177 Sleep Spindles as Predictor of Response to Cognitive Behavioral Therapy for Insomnia

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 3

Abstract | Résumé

Cognitive-behavioral therapy for insomnia (CBTi) is the first line treatment for insomnia disorder. Despite strong evidence for CBTi benefits, identifying predictors of response is essential for targeting likely responders and tailoring treatment for those with persistent symptoms. This randomized controlled trial aimed at determining whether sleep spindle characteristics at pre-treatment predicts CBTi response (<https://doi.org/10.1186/ISRCTN13983243>).

Participants with chronic insomnia (DSM-5 criteria) were randomized into a 3-month group-CBTi program (CBTi group, N=28, 21F) or a 3-month wait-list (WL group, N=20, 15F). All participants underwent a polysomnography and completed Pittsburg Sleep Quality (PSQI) and Insomnia Severity Index (ISI) questionnaires at baseline (T1) and at 3 months post-randomization (T2). Linear mixed-effects models were computed to assess whether changes in PSQI or ISI scores between T1 and T2 are predicted by sleep spindles characteristics. Models included the effect of time, group, sleep spindles characteristics, all their interactions, as well as age and sex as covariates. Analyses

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were conducted across multiple regions (C3/C4/Cz, F3/F4/Fz and P3/P4). The p-value was adjusted to account for these regions.

Higher spindle density at baseline in the frontal region was associated with greater reduction in PSQI scores in the CBTi group ($p < 0.01$). However, participants in the WL group with higher spindle density at T1 showed greater increase in PSQI scores after 3 months ($p < 0.01$). Similar patterns were observed in the central region, but the results did not remain significant after Bonferroni correction ($p > 0.00625$). For ISI scores, a similar trend was identified in the frontal region, though the results did not reach significance after Bonferroni correction ($p > 0.00625$).

Our results demonstrated that sleep spindle density may represent an endogenous biomarker for predicting responsiveness to CBTi. Participants suffering from chronic insomnia with higher spindle density seem to be more responsive to CBTi. Conversely, without CBTi, they experience a more significant increase in sleep impairment.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

ORAL SESSION 4: SLEEP PHYSIOLOGY: FROM MEASUREMENTS TO MEMORY CONSOLIDATION

26 The Influence of Disordered Sleep on the Wake Intrusion Index: A Structural Equation Modeling Approach

Mr. Matthew Gratton^{1,2}, Dr. Nancy Hamilton², Dr. Amber Watts², Dr. Emily Cramer³, Ms. Bethany Gerardy⁴, Dr. Magdy Younes^{5,4}, Mr. Garrett Baber^{1,2}, Dr. Diego Mazzotti¹

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 4

Abstract | Résumé

Introduction: Individually, insomnia and obstructive sleep apnea (OSA) are significant public health concerns. Insomnia affects nearly a third of the population, while OSA affects 9% to 38% of adults. Their co-occurrence (COMISA) results in severe health outcomes, including cardiometabolic and neurocognitive morbidity, impaired sleep quality, and reduced quality of life. Although both disorders disrupt sleep, it is difficult to disentangle the effect of each disorder physiological surrogates of sleep quality. This study attempts to quantify the contributions of OSA

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and insomnia to the Wake Intrusion Index (WII), a measure of subthreshold intrusions of wakefulness on sleep. We hypothesize that WII is influenced by both respiratory and non-respiratory arousal mechanisms.

Methods: We leveraged polysomnography data and self-reported insomnia symptoms from individuals in the Sleep Heart Health Study. WII was calculated based on the odds-ratio product, a measure of sleep depth. We used structural equation modeling to examine the shared and unique contributions of both respiratory indices such as the Apnea Hypopnea Index and the Oxygen Desaturation Index and frequency of different insomnia symptoms on the WII.

Results: We found that our data had a two-factor structure representing respiratory related arousals, which contained all the respiratory variables; and non-respiratory related arousal which contained the questions related to insomnia. Both respiratory and non-respiratory latent variables influenced the WII, however the non-respiratory arousal ($\beta=8.22$) factor had a notably higher influence on the WII over the respiratory arousal factor ($\beta=1.02$).

Conclusion: Our study demonstrates that both respiratory and non-respiratory arousal mechanisms significantly influence the WII. These findings highlight the importance of addressing both components in treatment strategies to improve sleep quality and overall health outcomes in COMISA patients.

Submission Category | Cat gorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

76 Exploring Age-Related Declines in Problem-Solving: The Influence of Spindle-Slow Wave Coupling

Dr. Daniel Baena^{1,2}, Dr. Balmeet Toor¹, Dr. Nicholas van den Berg³, Dr. Laura Ray¹, Dr. Stuart Fogel^{1,2,4}

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 4

Abstract | R sum 

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Introduction

As we age, sleep quantity and quality are reduced, affecting sleep-dependent memory processes. Age-related changes in spindles (SP) and slow waves (SW) reduce the benefit of sleep for memory consolidation. The interaction between SW and spindles during non-rapid eye movement (NREM) sleep supports memory consolidation. Critically, SW-SP coupling is impacted by age. This study examines the effects of SW-SP coupling on procedural memory, particularly for cognitively complex problem-solving skills.

Methods

A total of N=20 young participants (age 20-35) and N=15 older adults (age 60-85) were included in the study. Both groups completed the Tower of Hanoi (ToH) task at 10:00 am and slept in the laboratory from 1:00 pm to 2:30 pm. Following this, participants were retested on the ToH task at 5:00 pm.

Spindles and SW were automatically detected from artifact-free NREM sleep. Spindles were marked as coupled SW-SP complexes when the spindle occurred within a 4-second time window around the SW negative peak.

Bivariate correlation analyses were used to assess if offline gains in performance were related to SW-SP coupling. Next, standard multiple linear regression analyses were used to assess if age moderated the relationship between offline gains in accuracy and coupled events during the upstate.

Results

There was a significant relationship between offline gains in accuracy on the ToH and percent change of upstate SW-SP coupling in older ($r=0.74$, $p=0.006$), but not younger adults ($r=0.36$, $p=0.117$). Multiple regression revealed that age accounted for differences in offline gains in accuracy ($t=3.67$, $p=0.003$), as did spindle coupling during the upstate ($t=1.99$, $p=0.031$).

Conclusions

Our findings suggest for the first time that although slow wave-spindle coupling is reduced with age, the extent of coupling that remains serves as an indicator of how much older individuals will benefit from sleep in terms of offline consolidation for novel problem-solving skills.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

78 The Role of Slow Wave-Spindle Coupling in Enhancing Motor Memory Consolidation During Sleep

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 4

Abstract | Résumé

Introduction

Sleep is necessary for optimal consolidation of new memories. EEG-fMRI studies show spindle-related reactivation during sleep strengthens memory and enhances performance. Slow wave-spindle (SW-SP) coupling is important for memory consolidation though its relation to brain activation during motor skills memory consolidation remain to be investigated.

Methods

A total of N=31 participants aged 20-30 years were included in the study. We assessed the consolidation of a newly acquired 5-item MSL task relative to a motor control task in a within-subjects design.

Polysomnographic recordings were obtained using a MRI-compatible EEG system. Spindles were automatically detected using an established approach. Slow waves were automatically detected using period amplitude analysis. Spindles were marked as coupled SW-SP complexes when the spindle occurred within a 4-second time window around the slow wave negative peak.

A 3.0 Tesla Magnetom Prisma MRI system was used to obtain functional brain images. The onset and duration for each coupled SW-SP, uncoupled spindle, and slow wave events were identified from EEG data as events of interest. ROIs were selected based on prior SW-SP complexes and MSL-related brain activation. Beta values were extracted for each ROI and event type.

Results

Offline improvements in performance were observed after a period of sleep. Increased cerebral activation was observed time-locked to coupled SW-SP complexes in the primary sensorimotor cortex. Critically, these reactivations were significantly confined to the hemisphere actively involved in the learning task, corresponding to the area involved in hand movements ($p < 0.05$, FWE cluster-corrected).

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Conclusions

Our results show the link between sleep spindles and the offline reactivation of brain regions involved in motor sequence memory performance depends on whether they are coupled to SW. Moreover, regional hemispheric specificity highlights a targeted neural mechanism of memory consolidation during sleep, underscoring the crucial role of SW-SP coupling.

Submission Category | Catégorie de soumission

Sleep, brain plasticity and memory | Sommeil, plasticité cérébrale et mémoire

104 Sleep Spindles are Resilient to Post-traumatic Grey Matter Damage

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 4

Abstract | Résumé

Sleep spindles are bursts of NREM electroencephalographic activity involved in memory consolidation and protecting sleep against external disturbances. Despite their importance, the structural brain correlates of spindles remain unclear. This study investigated the link between grey matter volume (GMV) and spindle characteristics in adults with traumatic brain injury (TBI) who experienced significant brain atrophy compared to healthy controls. We recruited 27 adults with moderate to severe TBI (32.0±12.2 years old; 11–39 months post-injury) and 32 healthy controls (29.2±11.5 years old). Participants underwent a full-night polysomnography and a 3-Tesla MRI. Sleep spindles were detected during N2 and N3 sleep, and their density, amplitude, frequency, and duration were calculated. Sigma spectral power (11–16 Hz) was computed using the Fast Fourier Transform. Spindle density, characteristics, or sigma power did not differ between the two groups. Clusters with lower GMV in the TBI group compared to controls (right and left frontotemporal and left temporal clusters), identified through voxel-by-voxel comparisons, were used as regions of

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interest. We evaluated the relationship between GMV and spindles using moderation analyses, with Group as a moderator and age as a control variable. Larger left frontotemporal and left temporal GMVs predicted higher spindle amplitude and sigma power (no Group by GMV interactions), explaining 5%–17% of their variance. However, significant Group by GMV interactions were found for spindle frequency such that larger left and right frontotemporal GMVs predicted faster spindle frequency only in healthy controls, explaining up to 38% of spindle frequency variance. Our findings suggest that spindles are resilient to post-traumatic GMV loss. The absence of significant differences in spindles between the two groups and the lack of significant associations between GMV and spindle frequency in the TBI group suggests that other factors, such as genetics, may better explain spindle density and characteristics.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

117 Whole-Night EEG-fNIRS: A Novel Approach for Exploring Sleep Physiology in Healthy Adults

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 4

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

Sleep is not only characterized by Electroencephalography (EEG) signatures, but also by specificities in brain hemodynamic activity. Recent EEG/fMRI studies revealed distinct oscillations in regional blood-oxygen-level-dependent signal at 0.04-0.07Hz during N2 and 0.15-0.18Hz during N3. While EEG/fMRI sleep studies are challenging (immobility constraints, noise, limited duration), simultaneous EEG/functional Near-Infrared Spectroscopy (fNIRS) emerges as a promising multimodal approach for prolonged sleep monitoring, measuring hemodynamic fluctuations of cortical oxygenated (HbO) and deoxygenated hemoglobin concentration changes. However, the physiology of sleep-related hemodynamic processes and their spatio-temporal organizations remains poorly understood. We propose whole-night personalized EEG/fNIRS, using an optimized locally dense montage targeting bilateral frontoparietal regions, to investigate sleep-state-specific and region-specific patterns of HbO oscillations in healthy subjects.

Methods: Sleep EEG data were scored along American Academy of Sleep Medicine manual. Our fNIRS workflow optimized fNIRS sensor positioning to target bilateral frontoparietal regions. After applying fNIRS pre-processing, we applied time-frequency analysis using Morse analytical wavelet, using the Taeger-Kaiser normalization to disentangle oscillatory from aperiodic (1/f) components of HbO signals. HbO time-frequency results were considered to estimate HbO power spectra for each sleep state, including for the first-time REM phasic and tonic states.

Results: Our results from 8 subjects (4 females, 18-35years, mean sleep efficiency:90.3%) show sleep-state-specific signatures of hemodynamic oscillations, around 0.005 and 0.01Hz during tonic and phasic REM, respectively, around 0.03-0.06Hz during N2, and ~0.2Hz during N3, suggesting large respiration oscillations. We observed increased HbO spectral power within respiratory frequency during NREM compared to wake and REM (with an increase as NREM deepen), likely due to deeper, more regular respiratory patterns in deeper sleep.

Conclusion: we propose whole-night personalized EEG/fNIRS as a versatile modality to study sleep physiology, reporting specific spectral signatures of HbO oscillations across sleep states including for the first-time REM phasic and tonic hemodynamic characteristics.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

145 Development of a High-Density EEG-Based Real-Time Slow Wave Detection and Auditory Stimulation Software

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 4

Abstract | Résumé

Introduction:

Sleep slow oscillations (SOs) can be amplified through closed-loop auditory stimulation (CLAS) applied in the up-phase (peak). Here, we introduce the first CLAS software integrated directly into a high-density electroencephalography (hd-EEG) system, allowing for enhanced spatial resolution.

Method:

We developed an advanced real-time SO-detection algorithm implemented in a custom-designed CLAS software, interfacing directly with the MagstimEGI 128-channel hd-EEG system. The software applies an online 0.5-4Hz moving average filter to Fz, detecting SOs using amplitude and timing criteria while recording from all channels. Peaks are detected when: 1) the signal passes below -40 μ V; 2) then crosses 0; 3) difference in amplitude between the minimum (trough) and the current oscillatory activity is >75 μ V; and 4) peak occurs between 160ms-1700ms after the detected trough. Troughs are detected when: 1) the signal goes above 35 μ V; 2) then crosses 0; 3) difference in amplitude between the maximum (peak) and the current oscillatory activity >75 μ V; and 4) trough occurs between 160-1700ms after the detected peak. Upon detection, a 50ms burst of pink (1/f) noise is delivered. Asynchronous data processing and multi-threading techniques ensure minimal latency. The software was tested in overnight recordings with 9 healthy participants (23.3 \pm 3.8 years, 7 females). CLAS protocol began upon detecting N3 sleep, including three 5-min blocks: peak stimulation, rest (sham), and trough stimulation, repeated for up to three sleep cycles.

Results:

Our hd-EEG-CLAS system achieved 88.9% accuracy in precisely delivering auditory stimulations on SO peaks and troughs, indicating high precision in aligning stimulation timing with desired SO phases. We identified a stable 20ms delay between SO detection and sound administration.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Conclusion:

This novel hd-EEG-CLAS software demonstrates the feasibility of combining hd-EEG with real-time auditory stimulation to modulate SOs, enabling high accuracy, and better characterization of CLAS effects on oscillatory, functional and network properties of the brain.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

168 NAARE: Nonlinear Aperiodic Active-Rest Estimation

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 4

Abstract | Résumé

Introduction:

The study of circadian and active-rest rhythm has traditionally relied on linear/sinusoidal models (e.g., cosinor/harmonic estimations), which often oversimplify the underlying activity pattern. To address this limitation, we introduce NAARE (Nonlinear Aperiodic Active-Rest Estimation), a novel analytical method designed to provide a more accurate representation of active-rest dynamics while accommodating the inherent aperiodicity/variability in longitudinal time-series.

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Method:

This study included 282 24-hour-actigraphy recordings from the Institut National du Sport du Québec database. To account for the aperiodic and varying daily active-rest pattern, NAARE first assigned weights to each time point based on the asymmetrical least square smoothed predicted values from a base model (i.e., a gamma-generalized additive model, γ -GAM). Finally, it estimated the daily active-rest pattern via a weighted γ -GAM, which accounts for the naturally periodic physical activity via cyclic spline smoothing.

To assess the model fitness/performance, we compare the predicted daily active-rest pattern from NAARE with the 12/24-hour-period linear cosinor models and the 80% resolution smoothed data (via rolling median), using residual standard deviation (SDR), the area under the curve (AUC) ratio between the model and the original data, and Kendall's tau (τ). Statistical comparison was assessed via Kruskal-Wallis with pairwise Dunn test and Hommel's correction for multiple comparisons. Performance stability was estimated via pairwise F-test.

Results:

With the median correlation coefficient (τ) of 0.79 for smoothed data, NAARE (median $\tau=0.58$) showed a greater correlation with the original data than either cosinor estimates (12-hour=0.46, 24-hour=0.42, $p<0.001$). Both NAARE ($AUC_{\text{median}}=91.7\%$) and the smoothed data (91.2%) shared similar AUC ratios while were both significantly different and more consistent than the cosinor models (12-hour=97.2%, 24-hour=92.5%, $p<0.001$; pairwise-variance-test $p<0.001$). Similarly, NAARE ($SDR_{\text{median}}=244.0$) had lower standard deviation of residual than the cosinor models (12-hour=271.2, 24-hour=278.1, $p<0.001$)

Conclusion:

With its flexibility for irregular active patterns, NAARE demonstrated better signal representation than the cosinor models.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

175 Machine Learning Based Sleep Staging in Healthy and Sleep Disordered Pediatric Patients With EEG Signals

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 4

Abstract | Résumé

Manual sleep staging with polysomnography (PSG) data is an important step for the clinical diagnosis of sleep disorders. However, it is time-consuming and resource-intensive. While there is a rich body of literature on automated sleep staging in adults, limited work exists for the pediatric population with sleep disorders. This study aims to test the generalizability of a machine learning algorithm for sleep staging across normal and sleep-disordered breathing (SDB) data from a wide age range of children.

In this study, we used full-night PSG data from BC Children's Hospital (UBC Ethics H23-02977), including 60 normal participants (AHI < 3) and 40 SDB patients (AHI > 5). The age distribution of the two groups is 0.6-18.2 years old and 1.3-19.8 years old. We used 8 channels of electroencephalogram (EEG) data from PSG studies. From each EEG channel, we extracted 50 features, including statistical measures (standard deviation, mean, zero-cross rate, skewness, kurtosis), band power metrics, Hjorth parameters, wavelet energy, entropy and correlation dimension. A random forest model was trained on all normal participant data and tested on each set of SDB patient data.

Our model achieved a training accuracy of 100% in normal participants, with an average test accuracy of 76.7% in SDB patients. Maximum accuracy was 89.2%, and minimum accuracy was 57.3%. Accuracy in infants (0-1 years old) and the severe SDB group (AHI>30) was notably lower, averaging 59.8% and 62.4%, respectively.

Our results show that machine learning algorithms trained using normal sleep data may have limited generalizability across age and for SDB patients, especially for infants or those with severe SDB. This is likely due to the inherent differences in sleep patterns and signal characteristics of the infant and SDB groups. Therefore, retraining or transfer learning across diverse groups may be necessary to improve the generalizability of automated staging algorithms.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

ORAL SESSION 5: SLEEP HEALTH AND INSOMNIA: FROM ASSESSMENTS TO INTERVENTIONS

28 Providing Access to Cognitive-Behavioral Therapy for Insomnia in Cancer Care: Preliminary Results of an Implementation Study

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 5

Abstract | Résumé

Background: While cognitive-behavioral therapy for insomnia (CBT-I) is the recommended first-line treatment for cancer-related insomnia, it remains underutilized due to its limited accessibility. Our prior work showed that a stepped care approach, combining a web-based CBT-I and 1-3 booster therapy sessions, was not significantly inferior in producing sleep improvements than a standard 6-session CBT-I. The main goals of the IMPACT (Insomnia in Patients with Cancer – Personalized Treatment) program were to assess the feasibility and efficacy of implementing this stepped care CBT-I in four cancer centers in Quebec City. **Methods:** The study used a stepped wedge cluster non-randomized design. Patients having a score of 4 or greater on the sleep item of the *Edmonton System Assessment System-Revised* (ESAS-R-sleep) received a leaflet explaining the stepped care CBT-I and how to access the web-based program (first step). Patients with residual insomnia symptoms after completing this first step were offered 1-3 booster sessions with a clinical psychologist (second step). Uptake and retention rates were the main variables.

Results: Across cancer centers, 11.9%-50.8% of patients with insomnia were referred to the IMPACT program. Across cancer centers, 10%-54.9% of referred patients registered with the web-based CBT-I, 83.3%-90% of them initiated it and 26%-42.3% completed it. The most common reasons for not completing the web-based CBT-I were: 1) sleep difficulties improved or remitted (36.2%); and 2) the program did not meet patients' needs (23.4%). Among completers, 29%-56% had residual insomnia and were offered booster sessions. On average, sleep diary data collected during treatment (N=83) indicated a reduction of sleep-onset latency of 20 min and of wake after sleep onset of 45 min. Sleep efficiency increased from 70 to 85%. **Conclusions:** Although uptake and retention rates could be improved, these preliminary data suggest that stepped care CBT-I can be implemented in routine cancer care and is effective.

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Submission Category | Catégorie de soumission

Insomnia | Insomnie

69 YKL-40 as an Inflammatory Biomarker Indicative of the Severity of Pathological Insomnia

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 5

Abstract | Résumé

Introduction: Insomnia has been suggested as a pro-inflammatory condition linked to an increased risk of developing Alzheimer's disease (AD). YKL-40, a protein secreted by astrocytes and microglia during neuroinflammation, is an emerging biomarker associated with AD risk and neuroinflammatory processes. However, its concentration has not been explored in the context of insomnia. This study aimed to investigate the relationship of insomnia and its severity with plasma levels of YKL-40, suggesting a pathway through which insomnia may act as a risk factor for AD.

Materials and Methods: The study included 40 participants with clinically diagnosed insomnia (61.18 ± 8.32 years, 25W) and 34 controls (64.44 ± 5.86 years, 12W). Plasma YKL-40 concentrations were measured by ELISA. Sleep metrics were obtained through polysomnographic recordings. Linear regressions were used to analyze the relationship between Insomnia Severity Index (ISI) scores and YKL-40 levels. Additionally, ANCOVAs were conducted to compare YKL-40 concentrations between different group separations ex. (1) diagnosed insomnia vs. controls, and (2) insomnia if ISI score ≥ 15 , otherwise control.

Results and Discussion: In the full sample, no association was found between insomnia severity, insomnia status, nor any objective sleep metric and YKL-40 concentration.

Among the participants diagnosed with insomnia, those with severe insomnia ($ISI \geq 22$, $n=12$) exhibited higher YKL-40 levels compared to participants with non-severe insomnia ($ISI < 22$, $n=28$), and higher ISI scores were associated with higher YKL-40 levels.

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All analyses were adjusted for covariates such as age, sex, other sleep disorders, proinflammatory factors and medication usage.

Conclusion: Our findings suggest that insomnia severity in individuals diagnosed with insomnia, rather than insomnia status, is linked to YKL-40 concentrations. Inflammation, as indicated by YKL-40, may underlie the connection between severe insomnia and AD through an inflammatory pathway.

Submission Category | Cat gorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurod g n rescence

87 One's Spouse Poor Sleep Quality Is Associated with One's Diet Quality Via Impaired Diet-Related Action Control

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 5

Abstract | R sum 

Background: Cohabiting spouses co-create a home environment that promote certain eating habits. Poor sleep increases risk for unhealthy food choices. However, it is not clear how poor sleep may contribute to lower diet quality among couples. The goal of this study was to examine the actor and partner effects of poor sleep on diet quality and diet-related self-regulation processes.

Methods: In this longitudinal study, 196 couples completed the Pittsburgh Sleep Quality Index to assess sleep quality and the Starting the Conversion Questionnaire to evaluate diet quality at 3 time points over the course of 3 months. At study entry, participants also completed a 14-day daily diary assessment of diet-related action control including the self-regulation strategies of awareness of standards, self-monitoring, and self-regulatory efforts. To be included in the study, couples had to have been cohabiting for at least one year and had to include at least one partner who is overweight or obese and trying to change their lifestyle. Analyses were conducted using actor-partner interdependence modelling.

Findings: There were both actor and partner effects of poor sleep on diet quality. Similarly, there were actor and partner effects of poor sleep on diet-related action control. The indirect effect linking partner's sleep quality to actor's diet quality via actor's action control was significant. No significant gender differences were observed.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Discussion: These results highlight spousal interdependence in dietary habits and diet-related self-regulation processes and point to the role of poor sleep quality in contributing to both spouses' lower diet quality.

Submission Category | Cat  gorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions m  dicales (incluant COVID-19)

126 Designing Sleep Health Resources Together: Qualitative Perspectives from Young Shiftworkers

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 5

Abstract | R  sum  

Introduction: Shiftwork (employment falling outside traditional waking hours) disrupts sleep and circadian rhythms, increasing risk for numerous poor health, wellbeing, and safety outcomes amongst shiftworkers. Young adults are increasingly engaging in shiftwork, with early intervention models suggesting that tailored, evidence-based sleep resources could mitigate sleep and health risks if provided early in their careers. Despite this need, such resources are not currently available.

Methods: A participatory, co-design approach recruited 48 individuals with lived and/or professional experience in shiftworker to develop content for sleep resources. Participants included young, experienced, and previous shiftworkers, workplace health and safety specialists, science communicators, and academic experts who engaged in a series of iterative, online workshops to inform resource content and design. Reflexive thematic analysis of workshop transcripts identified codes, which were grouped into content themes, which provided the foundation of topics covered in the construction of sleep resources for young shiftworkers.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Results: Five themes were identified through the reflexive thematic analysis: sleep science basics (sleep disorders, circadian rhythms, chronotypes), impacts of poor sleep (health, wellbeing, safety), daily habits impacting sleep (environment, substances), strategies and actions (fatigue management, napping, stimulus control), and recommendations for workplaces (education, rostering). These themes appeared tiered in nature, in that they built a foundational understanding of sleep, before introducing strategies to improve sleep, and then suggestions for workplace modifications. Themes were populated with evidence-based content, and communicated via a suite of resources, including a website, a pictorial infographic, and an animated video.

Discussion: Tailored, evidence-based sleep resources were created based on qualitative input from young shiftworkers. These resources will allow for a point of early intervention to mitigate inadequate sleep and health risks for young shiftworkers. Resources now require formal evaluation to determine their impact on young shiftworker knowledge and behaviour.

Submission Category | Catégorie de soumission

Sleep and occupational health and safety | Sommeil et la santé et sécurité au travail

134 Insomnia Symptom Trajectories and Cognitive Markers of Alzheimer's Disease in Dementia-Free Older Adults

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 5

Abstract | Résumé

Background: The association of insomnia symptoms with brain health in dementia-free older adults is largely understudied, and most likely bidirectional. We aim to understand how longitudinal changes in insomnia symptoms are related to cognition in dementia-free older adults at high risk of developing Alzheimer's disease (AD).

Methods: We included 306 older adults from the **PREVENT-AD cohort**, who were cognitively unimpaired, at baseline, but presented with a familial history of AD, putting them at higher risk of

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developing AD. We derived a longitudinal insomnia symptoms index from the Pittsburgh Sleep Quality Index, using participant's first and last timepoints. The insomnia index combines questions on core insomnia symptoms: The presence of significant insomnia symptoms will be defined as sleep onset >30 min ≥ 3 times/week OR sleep maintenance is difficult ≥ 3 times/week AND these sleep disturbances interfere with daily life. We will compare four trajectories of insomnia symptoms over time: I) individuals without insomnia symptoms across time; II) individuals with insomnia symptoms across time; III) individuals who progress from none to newly develop insomnia symptoms across time; and IV) individuals with initial insomnia symptoms that disappear across time. We assessed the association between baseline cognition and insomnia symptom trajectories with ANCOVAs.

Results: Individuals having insomnia symptoms across time had significantly greater attention scores ($p=0.044$; Figure 1, B), and tended to have higher immediate memory and total cognition scores ($p=0.076$ and $p=0.057$; Figure 1, A and C respectively) compared to individuals who did not have insomnia symptoms across time. They also tended to present higher immediate memory scores compared to individuals who developed insomnia symptoms over time ($p=0.091$; Figure 1, A).

Conclusion: In Individuals at higher risk of AD, higher cognitive scores could reflect ongoing compensation mechanisms to cope with chronic insomnia. Alternatively, those with preserved cognition might report their age-related sleep disturbances more accurately.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

140 Digital Phenotyping for Sleep, Cognition, and Mental Health in Older Adults: A Feasibility Study and Implications for Cognitive Behavioral Therapy for Insomnia

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 5

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

The delivery and effectiveness of Cognitive Behavioral Therapy for insomnia (CBT-I) could be enhanced using digital phenotyping (DP). DP involves collecting and analysing data typically from smartphones and wearables, to gain insights into an individual's health and behaviour. Real-time data gathered on patients' sleep patterns and co-factors (e.g. mental health), could be used to personalise and adjust CBT-I treatment plans, ensuring they are aligned with patient-specific needs, potentially leading to improved outcomes. By providing personalised feedback, DP could enhance patient engagement and motivation, increasing adherence. Objective assessments provided by DP could allow for evidence-based decision-making. In this context, we built a DP platform and performed a proof-of-concept study with adults (65+), living at home (20 with and 5 without insomnia), to investigate the feasibility of using DP in informing CBT-I within this population. At onboarding, neuropsychological tests and standard sleep questionnaires were administered. For 14 days, participants completed daily ecological momentary assessments and cognitive games through a mobile application. Data was passively collected using wearables. Our platform was used to compute digital phenotypes pertaining to mood, cognitive state, and daily activities. Results show >80% of expected data was recorded, indicating experimental protocol adherence. Statistically significant correlations were found between self-reported sleep efficiency and morning irritability ($r=-0.179$, $p<0.05$), and sadness ($r=-0.266$, $p<0.001$). Baseline insomnia severity index correlated with mean sleep efficiency ($r=-0.475$, $p<0.05$). In terms of digital phenotypes, daily step number correlated with self-reported anxiety ($r=-0.17$, $p<0.01$) and stress ($r=-0.19$, $p<0.01$); similarly for daily call duration ($r_{\text{anxiety}}=-0.33$, $p_{\text{anxiety}}<0.001$, $r_{\text{stress}}=-0.23$, $p_{\text{stress}}<0.001$). Thus, our digital phenotyping framework could be used to inform CBT-I interventions; a pilot study using this approach is underway.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

142 Preliminary Feasibility, Acceptability, and Effects of iCANSleep: A Mobile Insomnia Treatment App for Cancer Survivors

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Memorial University of Newfoundland, St. John's, NL, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 5

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

Objective: Cancer survivors have rates of insomnia that are 2-3 times greater than the general population and is one of the greatest barriers to returning to usual functioning after cancer. CBT-I is the recommended treatment for insomnia, but it is largely inaccessible, due to a shortage of providers. iCANSleep is a smartphone app that was co-designed to deliver cognitive behavioural therapy for insomnia (CBT-I) to cancer survivors. An e-health approach is one way to increase accessibility of CBT-I. This study presents interim feasibility, acceptability, and efficacy outcomes of the iCANSleep app.

Methods: Canadian cancer survivors with insomnia disorder were recruited to test the feasibility and acceptability of the iCANSleep app. The Acceptability E-Scale was used to examine acceptability of the app (total scores range from 5-30). The Insomnia Severity Index was used to assess insomnia symptoms, and the Patient-Reported Outcome Measurement Information System (PROMIS) was used to measure fatigue, cognitive function, anxiety, and depression before and after the program. Descriptive statistics and paired sample t-tests were used to examine differences before and after CBT-I.

Results: To date, 54 participants have been recruited ($M_{age}=54.56$ years, 94% women). Twenty participants have finished the program, 25 are currently using the app, 5 are in the onboarding process, and 4 have been lost to contact. Participants who completed the program reported a high Acceptability E-Scale score ($M=27.5$). Participants reported a significant reduction in insomnia [$t(19)=7.92, p<.001$], fatigue, [$t(19)=3.76, p<.001$], cognitive impairment, [$t(19)=3.53, p=.002$], and anxiety, [$t(19)=5.01, p<.001$]. There was no significant difference in depression.

Conclusion: The iCANSleep app may be a promising tool to provide CBT-I to cancer survivors. Once feasibility testing is complete, required modifications to the iCANSleep app will be made, and then a randomized controlled trial will be used to formally assess program efficacy.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

173 Digital Cognitive Behavioral Therapy Intervention for Reducing Insomnia and Anxiety Symptoms in Older Adults

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 5

Abstract | Résumé

Insomnia, often linked to anxiety, is common among older adults. While cognitive-behavioral therapy (CBT) is the primary treatment, its availability remains limited due to a shortage of trained professionals and high costs. We developed an online CBT program for insomnia and anxiety (eCBT+). This randomized controlled trial aimed to assess the usability and acceptability of the platform for eCBT+ intervention and evaluate its efficacy in older adults with insomnia (<https://doi.org/10.1186/ISRCTN15338211>).

Older adults (≥ 65 y.o.) with insomnia (ISI score ≥ 8) were randomized to an eCBT+ intervention (N=47, 35F) or a 7-week wait-list (WL) control (N=45, 34F). Both groups completed ISI, GAI, and 2-week sleep diaries to assess sleep efficiency (SE) before and after 7 weeks. After the eCBT+ program, participants completed an adapted System Usability Scale (SUS) and the extended Technology Acceptance Model (TAM-2) questionnaire to evaluate platform usability and program acceptability. ANCOVAs on SE, ISI, and GAI assessed the eCBT+ effect, with age and sex as covariates.

The platform was deemed user-friendly (SUS score= 66.7%). Perceived ease of use (19%), perceived usefulness (18%) and result demonstrability (18%) were the main factors contributing to its acceptability. A significant group*time interaction revealed lower ISI ($F=15.8$, $p<0.001$) and lower GAI score ($F=22.6$, $p<0.001$) post-intervention in the eCBT+ group, compared to the WL group. A greater increase of SE was also observed in the eCBT+ group compared to the WL group after intervention ($F=11.2$, $p<0.01$).

Our results highlight the usability and acceptability of this eCBT+ program in older adults. We further demonstrate the efficacy of the eCBT+ program for reducing insomnia severity and anxiety symptoms. Web-based tools offer further strategies to improve sleep and mental health in older adults with insomnia.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

181 Sleep Health Promotion on a National Scale: Insights from the Week for Better Sleep Initiative

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 5

Abstract | Résumé

Introduction: Sleep is essential for physical and mental well-being, daytime functioning, and quality of life. However, it remains undervalued as a core component of healthy lifestyle. This study aimed to evaluate the reach and perceived impacts of a national interactive sleep health promotion campaign, as well as gather information about preferences for the content and format of subsequent sleep awareness initiatives in Canada.

Methods: In March 2024, the Canadian Sleep Research Consortium launched a virtual sleep health promotion program, *Week for Better Sleep (WFBS)*, for Canadians of all ages. A total of 560 Canadians from 11 provinces and 1 territory, registered for the WFBS (80.4% women; 0 to 93 years old). Participants completed sleep questionnaires, kept a digital sleep diary, and received daily sleep tips over a one-week period. Following the WFBS, participants had the opportunity to provide feedback in an exit survey.

Results: Participants were asked to rate their sleep quality at registration. Most participants reported their sleep quality was fair (33.5%) to poor (23.5%). At the end of the program, over 75% of participants who completed the WFBS agreed or strongly agreed that the sleep tips gave them new ideas for improving their sleep. About 80% indicated that the WFBS helped them reflect about their sleep or that of their children, and 90% reported that they intended to use some of the sleep tips in the future. Participants made suggestions for improving future iterations of WFBS, including more

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tailored and personalized sleep tips, increasing scientific content, more feedback relying on sleep diaries, and further integration of videos and infographics.

Conclusion: This evaluation suggests that brief national campaigns to promote sleep health are feasible, acceptable, and meet a public demand for accessible and equitable sleep health information adapted to diverse sleep profiles. Our findings will inform the development of future campaigns for improving sleep.

Submission Category | Catégorie de soumission

Sleep equity | Équité face au sommeil

200 Where Data Meets Therapy: A Preliminary Qualitative Overview on the Integration of Portable Sleep EEG Monitoring in Digital Cognitive-Behavioural Therapy for Insomnia

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 5

Abstract | Résumé

Introduction: Sleep diaries are the standard measure on which progressive sleep manipulations in cognitive-behavioural therapy for insomnia (CBT-I) are based, yet their use presents challenges, such as inaccuracies, incomplete data, and increased burden, particularly in clinical populations. Portable sleep monitors offer an objective alternative, but they can introduce issues like orthosomnia, where individuals become preoccupied with achieving “perfect” sleep. This study compared experiences with digital CBT-I (dCBT-I) when using sleep diaries or a portable sleep EEG monitor throughout the intervention.

Methods: Seventeen individuals with chronic insomnia and comorbid depressive symptoms participated in a five-week dCBT-I program. Participants were randomly assigned to either a subjective group, using sleep diaries, or an objective group, utilizing an EEG-based sleep wearable. In the objective group, time-in-bed restriction was informed by EEG data, and participants received weekly objective sleep reports. Post-intervention, semi-structured interviews were conducted using a phenomenological approach to explore participants' experiences.

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Results: Eight participants from the subjective group and nine from the objective group completed interviews. Participants using sleep diaries found them easy and quick, but noted difficulties with adherence and sleep estimation. The wearable group perceived EEG data as accurate and found that recurring sleep reports during dCBT-I positively influenced treatment adherence, motivation, and sleep misperception awareness. Some participants communicated encountering technological difficulties, which triggered anxiety and frustration in a subset of individuals. A minority reported experiencing "performance anxiety" related to their sleep data outcomes.

Conclusion: Preliminary findings suggest that integrating portable sleep EEG monitoring in dCBT-I may enhance treatment motivation and insight into sleep patterns. Support may be needed to address potential technological issues, handle sleep misperception, and balance objective data use to avoid orthosomnia. Future research should focus on establishing protocols to optimize the therapeutic benefits of portable sleep monitors and determine contexts where their use may facilitate individualized care.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

ORAL SESSION 6: BASIC SCIENCE OF SLEEP AND CIRCADIAN RHYTHMS

10 Investigation of the Glymphatic System as a prognostic marker for Dementia with Lewy bodies and Parkinson's Disease

Ms. Violette Ayras^{1,2}, Ms. Liane Desaulniers², Ms. Marie Filiatrault^{2,1}, Ms. Celine Haddad^{3,2}, Dr. Alex Pastor-Bernier², Dre. Véronique Daneault², Dre. Christina Tremblay², Dre. Aline Delva^{4,5}, Dr. Jean-François Gagnon^{2,6}, Dr. Ronald Postuma^{2,4,5}, Dr. Johannes Klein⁷, Dre. Michele Hu⁷, Dr. Stéphane Lehericy⁸, Dre. Isabelle Arnulf⁸, Dre. Marie Vidailhet⁸, Dr. Jean-Christophe Corvol⁸, ICEBERG Study Group⁸, Dr. Petr Dusek⁹, Dr. Stanislav Marecek⁹, Dre. Zsoka Varga⁹, Dr. Shady Rahayel^{2,10}

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 6

Abstract | Résumé

Background : Isolated REM sleep behavior disorder (iRBD), a parasomnia characterized by a loss of muscle atonia during REM sleep, is recognized as one of the earliest indicator for developing Dementia with Lewy Bodies (DLB) and Parkinson's Disease (PD). The glymphatic system is a waste clearance network whose dysfunction is suggested to be associated with numerous cognitive disorders. As a prodromal synucleinopathy, studying the glymphatic system in iRBD patients is crucial for understanding the progression to DLB.

Methods : Diffusion MRI data from 534 participants from an international multicentric cohort (276 iRBD, 259 controls) were analyzed. Using the FA map from the ICBM_DTI-81 atlas, we created cubic binary masks (5mm) on bilateral associative and projection fibers at the level of the lateral ventricle. These masks were then aligned to the standard space of each participant using ANTs, followed by quality control. The masks were then multiplied by each directional diffusivity map (x,y,z) obtained from the Tractoflow (FA RGB) results in the subject space. Bilateral, left and right APLS indices were extracted from the diffusivity data of the x, y and z axes.

Results : A significant difference in the left APLS index was observed between controls and iRBD participants, with no significant difference in bilateral and right APLS indices. A decreased left APLS index was revealed in phenoconverted iRBD compared to non-converted iRBD. A logistic regression analysis identified the left APLS index as a significant predictor of conversion, while a multinomial regression showed a significant result for the left APLS index to predict PD, but not DLB.

Conclusion : These findings confirm the presence of glymphatic dysfunction in a larger cohort of iRBD and could serve as a valuable early prognostic biomarker.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

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16 Median Raphe Glutamatergic Neurons Activity in Relation to Vigilance States and Their Modulation of Hippocampal Rhythms

Justine Fortin-Houde^{1,2}, Anne-Sophie Simard^{1,2}, Annie Durand-Marandi^{1,2}, Mathilde Paolini², Guillaume Ducharme², Bénédicte Amilhon^{1,2}

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 6

Abstract | Résumé

The median raphe contains diverse neuronal populations including hippocampus-projecting glutamatergic neurons expressing the vesicular glutamate transporter type 3 (VGLUT3). The median raphe is known as a powerful modulator of hippocampal rhythms including sharp-wave ripples (~50 ms, 150-250 Hz) occurring during NREM sleep and theta (5 to 12 Hz) occurring during both wake and REM sleep. Both rhythms are involved in memory consolidation. The specific contribution of the median raphe VGLUT3+ neurons to hippocampal activity is still unclear. In this study, we aim to characterize median raphe VGLUT3+ neuronal population activity during vigilance states and in relation to hippocampal rhythms. To target median raphe VGLUT3+ neurons, we injected Cre-dependent viral vectors in VGLUT3-Cre mice allowing for specific expression of calcium sensors and optogenetics tools in our population of interest. First, we assessed median raphe VGLUT3+ population activity in relation to hippocampal activity during the sleep-wake cycle. To do so, we used simultaneous electrophysiological recordings in the hippocampus with fiber photometry recordings in the median raphe. We observed that VGLUT3+ neurons were highly active during wake and REM sleep while they were active in short bouts during NREM sleep. Second, we optogenetically activated or inhibited glutamatergic neurons during different vigilance states to assess their potential to modulate hippocampal rhythms. Activation of VGLUT3+ neurons during non-REM sleep suppressed sharp-wave ripples and modulated theta rhythm power during REM sleep. Activation of median raphe glutamatergic neurons at 8 Hz also prolonged the duration of REM episodes. Taken together, our results highlight diverse activity patterns of VGLUT3+ median raphe neurons in relation to sleep states and reveal their powerful inhibitory control of hippocampal sharp-wave ripples and theta rhythm. These results suggest an important contribution of the median raphe to sleep-dependent memory consolidation.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

22 Circuit Control of Cortical Theta Activity During REM Sleep

Ms. Anita Taksokhan, Dr. Jimmy Fraigne, Ms. Vasilisa Nikiporets, Dr. John Peever

University of Toronto, Toronto, ON, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 6

Abstract | Résumé

One of the many features of REM sleep is theta activity, defined as neuronal firing within a 4-8 Hz range frequency. Although studies have addressed the importance of theta activity in learning and memory, little is known about the circuits that regulate theta activity during REM sleep. Our hypothesis is that glutamate sublaterodorsal tegmental nucleus cells (SLD^{Glut}) that generate REM sleep communicate with GABA medial septum neurons (MS^{GABA}), which generate theta activity, to control REM sleep specific theta activity. Our goals are to identify the pathways that connect the SLD^{Glut} with the MS^{GABA} and determine how these circuits modulate theta activity during REM sleep. To achieve these goals, we used viral tracing, electrophysiological, and optogenetic methods in naturally sleeping mice.

We found that optical silencing of SLD^{Glut} neurons during REM sleep reduced theta activity (paired t-test, $p < 0.001$, $n = 11$), suggesting that SLD^{Glut} neurons are critical for promoting theta activity during REM sleep. Moreover, optically silencing MS^{GABA} neurons suppressed theta activity during REM sleep (unpaired t-test, $p < 0.01$, $n = 8$), confirming that MS^{GABA} neurons control theta activity. Using viral tracing we identified the pathways by which SLD^{Glut} neurons communicate with MS^{GABA} neurons. Interestingly, we found that SLD^{Glut} neurons do not directly project to the MS. Instead, they densely innervate glutamate neurons in the lateral supramammillary cortex ($SuML^{Glut}$), which have previously shown to modulate theta activity. We demonstrated that power of theta activity was significantly reduced when we optically silenced the $SLD^{Glut} \rightarrow SuML^{Glut}$ circuit (14%), $SuML^{Glut}$ neurons (21%), or the $SuML^{Glut} \rightarrow MS$ circuit (21%) during REM sleep (paired t-test, $p < 0.01$, $n = 6$ for all regions). Finally, optical activation of the $SLD^{Glut} \rightarrow SuM^{Glut}$, or $SuM^{Glut} \rightarrow MS$ pathways during NREM sleep shifted cortical activity from prominent delta to theta frequency (two-way ANOVA, $p < 0.01$, $n = 5$).

Our results indicate that REM sleep-generating SLD^{Glut} neurons regulate theta activity by manipulating the activity of SuM^{Glut} neurons.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

25 REM Sleep Behaviour Disorder in Mouse Models of Parkinson's Disease and Multiple System Atrophy.

Ms. Brittany Dugan, Mr. Russell Luke, Dr. Jimmy Fraigne, Dr. Joel Watts, Dr. John Peever

University of Toronto, Toronto, ON, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 6

Abstract | Résumé

RBD is a parasomnia in which patients exhibit abnormal motor movement during REM sleep. Following RBD onset, 80-90% of patients develop a synucleinopathic disorder such as Parkinson's disease (PD) or multiple system atrophy (MSA), making RBD a prodromal disease state and the best predictor of synucleinopathic disease.

Interestingly, RBD is comorbid in only 25-58% of PD patients but is present in almost 100% of MSA patients. Further, the distribution of pathology, disease severity, and affected cell types markedly differ between diseases. It is theorized that while one protein may underly all synucleinopathies, structural differences may drive different strains of disease. Whether strains underly differences in RBD development, however, remains untested. Here, we examine pathological and behavioural differences between mouse models of RBD-MSA and RBD-PD.

We injected mice with brain lysate derived from either a PD or MSA mouse model into the brainstem regions that engage REM sleep muscle atonia. Mice were then sacrificed at varying time points for histological analysis (n = 4 per group), and at the same time points, another cohort of mice were evaluated for RBD-like behaviours using polysomnographic recordings (n = 7-9 per group).

We found that induction of either PD- or MSA-like disease in the brainstem results in RBD-like behaviours. Both strains of mice develop RBD at similar rates, suggesting that disease strain does not impact the rate of RBD pathogenesis. However, we found differences between strains in disease incubation time, motor symptom development, and end-point phenotypes, with RBD-MSA mice exhibiting more severe outcomes. In addition, both MSA- and PD-like mice exhibit disrupted sleep-wake architecture over time compared to controls.

Our findings demonstrate that RBD behaviours can develop in both MSA and PD mouse models, suggesting that REM sleep atonia-generating neurons exhibit vulnerability in both disease contexts.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

29 Norepinephrine Regulates REM Sleep and Cataplexy Through Direct Effects on the vIPAG-LPT

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University of Michigan, Ann Arbor, MI, USA

ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 6

Abstract | Résumé

REM sleep is carefully regulated by a network of brainstem nuclei, including the ventrolateral periaqueductal grey and adjacent lateral pontine tegmentum (vIPAG-LPT). Disorders of REM sleep, like narcolepsy, are debilitating for those afflicted and may involve dysregulation of the vIPAG-LPT. The vIPAG-LPT is known to regulate REM sleep through inhibition of the downstream REM-promoting regions like the sublaterodorsal nucleus, however, little is known about how afferent regions modulate vIPAG-LPT activity to influence REM sleep. To address this, we used retrograde tracing to identify upstream neuronal populations that project to the vIPAG-LPT and found that it receives input from norepinephrine neurons in the locus coeruleus (LC-NE). While LC-NE neurons have an established role in promoting arousal, recent evidence also demonstrates a role for LC-NE in sleep - particularly in regulating the timing of entrances into REM sleep. In the present study, we used *in vivo* fiber photometry and circuit-specific optogenetics to elucidate the pattern of release and functional role of NE in the vIPAG-LPT during sleep. Furthermore, we also investigated this circuit in orexin knockout mice, a murine model of narcolepsy, to elucidate its role in cataplexy, the intrusion of REM sleep muscle atonia during wakefulness. We show that NE release in the vIPAG-LPT abruptly halts at the onset of both REM sleep and cataplexy. We then show that phasic stimulation of LC-NE projections to the vIPAG-LPT can induce wakefulness, but tonic stimulation suppresses entrances into REM sleep and cataplexy without inducing wake. Lastly, we explored the postsynaptic effect of NE release on the activity of vIPAG-LPT neurons. These findings suggest that NE release functionally modulates the REM sleep ‘flip-flop’ switch and advance our understanding of the neurobiology of both REM sleep and cataplexy.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

94 Do Disease Mechanisms in RBD Start in the Peripheral Nervous System?

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 6

Abstract | Résumé

REM sleep behaviour disorder (RBD) is characterized by violent dream enactment that often leads to patient or bed-partner injuries. 80-90% of RBD patients eventually develop Parkinson's disease (PD) or a related disorder, making RBD the strongest predictor of synucleinopathies. It's thought that Lewy pathology (i.e., α -synuclein aggregates) in REM sleep circuitry is the disease mechanism that leads to REM sleep without atonia in RBD. Because Lewy pathology is also present in peripheral tissues (e.g., submandibular glands), it's hypothesised that Lewy pathology begins in the periphery and then travels to the brain. However, it is unknown if peripheral Lewy pathology can induce neurodegeneration of REM sleep circuits. Therefore, we seeded Lewy pathology (i.e., pathogenic α -synuclein fibrils) in the submandibular gland and then determined if it spread to the REM sleep circuitry to cause RBD. We used immunohistochemistry to determine if Lewy pathology was present in the REM sleep atonia circuits (i.e. ventral medulla and sublaterodorsal nucleus) and used electrophysiology/videography to determine if mice developed RBD symptoms. Two months after α -synuclein fibril injection, we identified α -synuclein aggregates in the submandibular gland but found no evidence of Lewy pathology in the brainstem ($n = 4$). However, 4 and 6 months after fibril injections, we observed significant levels of Lewy pathology in the REM sleep atonia circuit. But more importantly, we found that mice also exhibited RBD symptoms that were characterized by loss of REM sleep muscle atonia and excessive motor behaviours during REM sleep ($n = 9$, $p < 0.05$). Our data therefore support the hypothesis that RBD is caused by Lewy pathology within the REM atonia circuits and that the disease mechanisms in RBD originate in the periphery and then spread to the CNS, invading the cell circuits that control REM sleep muscle atonia.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

132 Mechanisms of Cholinergic Pre-Motor Modulation of Hypoglossal Motor Activity Identified from Combined 'Opto-Dialysis' In-Vivo

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 6

Abstract | Résumé

The hypoglossal motor nucleus (HMN) innervates the tongue musculature and helps maintain an open upper airway for effective breathing. A muscarinic acetylcholine receptor (MAchR) mechanism at the HMN suppresses tongue motor activity in animal models, and anti-MAchR agents comprise pharmacotherapy for obstructive sleep apnea (OSA) in humans. However, the cellular source and operation of cholinergic modulation of hypoglossal motor activity is unknown in-vivo.

Here we test the hypothesis that premotor cholinergic neurons from the intermediate reticular nucleus (IRt) modulate respiratory and/or tonic HMN activity via MAchR and nicotinic (N)AChR mechanisms in-vivo.

We combined optical stimulation of light-sensitive cation channels (channelrhodopsin, ChR2) expressed exclusively on cholinergic neurons in transgenic mice (ChAT-ChR2(H134R)-EYFP, n=7) with simultaneous microdialysis perfusion of the HMN ('Opto-Dialysis'). Tongue motor output in response to 0 (sham) to 20mW photo-stimulations (2-sec, 473nm) were measured under isoflurane anesthesia with MAchR antagonism at the HMN (scopolamine, 2mM) alone or combined with NAchR antagonism (mecamylamine, 200µM).

MAchR antagonism at the HMN *increased* endogenous *respiratory* hypoglossal motor activity at *higher* stimulation intensities at the IRt (20mW, P=0.030) whereas *NAchR* antagonism *decreased* respiratory tongue motor activity at *lower* stimulation intensities (5mW, P=0.012). These data identify drive-dependent *opposing* inhibitory and excitatory modulation of respiratory hypoglossal motor output by *MAchR* and *NAchR* mechanisms respectively. In contrast, *MAchR* antagonism alone or combined with *NAchR* antagonism *decreased* evoked *tonic* hypoglossal motor activity (10 and 20mW, P<0.034) identifying a *reduced tonic excitatory* effect following IRt stimulation.

The IRt constitutes the largest innervation of the HMN, largest source of cholinergic inputs, and the key relay station for transmission of respiratory drive to the HMN. These data identify differential opposing inhibitory and excitatory modulation of HMN activity that shapes tonic and respiratory motor outputs. Findings are relevant to control of the upper airway musculature, the pathogenesis of OSA and its pharmacological treatment.

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Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

147 The Acute Impact of Daylight Saving Time on Myocardial Infarct Size, Body Temperature and Rest-Activity Cycles: A Rat Model.

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 6

Abstract | Résumé

The transition to daylight saving time (DST) can be followed by an increased risk/severity of acute myocardial infarctions (AMI). Here we present a rat model with promising results.

Sprague-Dawley rats (10 and 15 months old) were exposed or not to one supplementary hour of light (13h instead of 12h) at the end of the light period, mimicking the transition to DST, followed by a standard 12h-long dark period. The next morning, AMI was induced in a subgroup of rats by occluding the left anterior descending artery for 30 minutes; control rats were sham operated. Tissue necrosis was measured 24h later using the % of infarcted cardiac tissue relative to the area at risk (I/AR). In another subgroup, activity and body temperature cycles were recorded with actigraphy for one week before and after DST.

DST induced larger I/ARs compared to control in middle-aged ($48.5 \pm 3.2\%$ vs $39.3 \pm 2.3\%$; $p < 0.05$) and older rats ($31.9 \pm 2.0\%$ vs $24.3 \pm 1.3\%$; $p < 0.01$). Melatonin levels tend to be lower in DST rats vs controls in middle-aged (263.8 ± 42.2 pg/mL vs 326.6 ± 35.6 pg/mL; $p = 0.161$) and older rats (282.3 ± 34.7 pg/mL vs 344.2 ± 23.6 pg/mL; $p = 0.167$). Body temperature started to increase by 25% during light period relative to baseline on the third day following DST; a significant 35% increase occurred at days 6 and 7. There were no significant effects of DST on the rest-activity cycle.

The results on myocardial infarct size are compatible with the literature in humans. Unlike humans, rats sleep during the light period, when melatonin levels are low, which dissociates sleep from the human circadian markers of sleep. The present results thus suggest that increased infarct size following DST is a matter of circadian rhythms perturbation rather than sleep perturbation. This hypothesis needs to be further supported by supplementary evidence.

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Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

174 Pre-Clinical Investigation of Noradrenergic-Antimuscarinic Modulation of Sleep and Motor Activities in Rats

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 6

Abstract | Résumé

The most effective obstructive sleep apnea (OSA) pharmacotherapy to date comprises a noradrenaline reuptake inhibitor combined with a muscarinic receptor antagonist: atomoxetine-oxybutynin (“ato-oxy”). A contribution of translational sleep science is to test and identify mechanisms, and refine tractable targets for OSA pharmacotherapy in animal models. Such pre-clinical studies have not been performed for ato-oxy.

Here we performed a randomized, within-subject, repeated measures design over two separate days in chronically instrumented rats (7:4 male:female) to identify effects of ato-oxy on sleep and breathing.

Wistar rats were instrumented with electroencephalogram and neck electromyogram electrodes to identify sleep-wake states and genioglossus and diaphragm electrodes for respiratory muscle recordings. Rats received ato-oxy (10 mg/kg-0.5 mg/kg) or saline control via intraperitoneal injection. Rats were kept on a 12/12 light/dark schedule with the lights-on/rest period starting at 7am. Data were analyzed for 2hrs pre-injection (7-9am) and 10hrs post-injection (9am-7pm) with data reported here from 10am-2pm.

Ato-oxy exerted significant effects on sleep-wake regulation compared to control, with increased wakefulness and markedly reduced REM sleep (median wakefulness 21.7 to 42.0 min/hr, $P=0.009$, REM 6.8 to 1.0 min/hr, $P<0.001$, NREM 28.9 to 17.7 min/hr, $P=0.06$). Effects on REM sleep were due to reduced numbers of REM sleep bouts (7.0 to 1.0 bouts/hr, $P<0.001$) but not duration (77.2 vs. 72.2 seconds, $P=0.56$), suggesting effects on REM sleep initiation but not maintenance. Postural (neck) muscle activity across sleep-wake states was not affected by saline or ato-oxy ($P=0.059$). Preliminary analyses suggest no significant effect on genioglossus activity or respiratory rate in NREM or REM sleep ($P>0.236$).

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To date we identify significant effects of ato-oxy on modulation of sleep-wake architecture but not motor activities in chronically instrumented rats. The effects of each individual agent on dynamics of sleep and respiratory motor activities are being investigated.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

ORAL SESSION 7: SLEEP APNEA AND CENTRAL DISORDERS OF HYPERSOMNOLENCE

12 Repeated Dosing of 50 Mg Daridorexant in Patients With Severe Obstructive Sleep Apnea: Effect on Sleep-Disordered Breathing and Sleep

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 7

Abstract | Résumé

Introduction: Daridorexant is a dual orexin receptor antagonist approved for the treatment of adult patients with insomnia. In a phase 1 trial, daridorexant was shown to have no negative effect on sleep-disordered breathing in patients with mild to moderate obstructive sleep apnea (OSA).

Methods: This randomized, double-blind, single center, placebo-controlled, crossover phase 1 trial evaluated whether repeated dosing (5 nights) of 50 mg daridorexant is safe in sixteen patients with severe OSA without insomnia, based on the treatment difference (daridorexant–placebo) not \geq 10 events/h for apnea/hypopnea index (AHI) and/or \leq -2% for mean nocturnal oxygen saturation (SpO₂). Other respiratory variables were explored using treatment difference (daridorexant–placebo) and its two-sided 90% CI. Effect on sleep was explored based on total sleep time (TST), rapid eye movement (REM), and non-REM sleep.

Results: Baseline AHI and mean nocturnal SpO₂ were 51.2 events/h (standard deviation [SD]: 17.0) and 92.1% (SD: 1.7). No clinically meaningful effect on AHI and mean nocturnal SpO₂ were

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detected. Treatment differences were -3.74 events/h (upper 95% CI: ≤ 4.23 events/h) and -0.12 % (lower 95% CI: ≥ -0.62 %). AHI and mean SpO₂ during non-REM were comparable with daridorexant and placebo. AHI showed improvement during REM sleep with daridorexant as treatment difference was -8.2 events/h (90% CI: -13.7, -2.7). No treatment difference was observed for the evaluated indices of disease severity, e.g., the total number of apneas and hypopneas and their longest duration, lowest SpO₂ during respiratory events, or %TST with SpO₂ < 90%. Compared with placebo, daridorexant increased TST by 32.5 min mainly by increased duration of REM sleep. Three out of six adverse events were under daridorexant (all mild), none were related to respiratory function.

Conclusions: Daridorexant does not impair sleep-disordered breathing and may improve sleep in patients with severe OSA. Daridorexant does not impair sleep-disordered breathing, independent of OSA severity.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

13 Effect of Daridorexant on Patients With Comorbid Insomnia Disorder and Untreated Mild Obstructive Sleep Apnea: A Post-Hoc Analysis of a Phase 3 Study

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 7

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Abstract | Résumé

Introduction:

Obstructive sleep apnea (OSA) prevalence in patients with insomnia disorder (ID) is ~30%-40%. Daridorexant 50 mg improved sleep and daytime functioning in patients with ID and did not impair nighttime respiratory function in patients with OSA. This post-hoc analysis investigates its effects in patients with comorbid ID and untreated mild OSA.

Methods:

Efficacy and safety of daridorexant 50mg is evaluated in a subgroup of participants with “mild OSA” (AHI: 5–<15 events per hour) at screening from the 3-month Phase 3 trial (NCT03545191). Endpoints assessed at Month (M) 1 and M3 include PSG measured wake after sleep onset (WASO) and latency to persistent sleep (LPS), Epworth Sleepiness Scale® (ESS®), visual analog scale (VAS) morning sleepiness and treatment-emergent adverse events (TEAEs). Results are reported as mean (SD). P values not adjusted for multiplicity are based on a linear mixed effects model for repeated measures versus placebo.

Results:

Of 930 randomized participants, 153(17%) had mild OSA (daridorexant: 50mg: n=53, 25mg: n=53; placebo: n=47), 772(83%) had AHI <5 events per hour ‘no OSA’ and 5 had missing AHI. Participants with mild OSA (versus no OSA) were older, had a higher male proportion, a higher BMI, and longer baseline WASO (114.2 [40.8] versus 95.5 [38.1] min). Baseline LPS was 64.9 (36.8) min, ESS® was 6.4 (5.2) and VAS morning sleepiness was 42.8 (20.0). Daridorexant 50mg versus placebo improved WASO and LPS. ESS® scores remained unchanged from baseline to M1 and M3 for daridorexant and placebo. Daridorexant 50mg reduced morning sleepiness to a greater extent than placebo. TEAE incidence was 45.3% (daridorexant 50mg) and 38.3% (placebo). Two placebo group participants discontinued study treatment due to AEs. One participant reported somnolence (daridorexant 50mg).

Conclusions:

Daridorexant 50mg improved sleep among patients with comorbid insomnia and untreated mild OSA with an acceptable safety profile.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

61 Individualized Dosing Strategies for Oxybate: Insights From the Real-World TENOR Study

Dr. Shawn Candler¹, Dr. Charles Bae², Mr. Douglas S. Fuller³, Dr. Thomas J. Measey³, Dr. Aatif M. Husain⁴, Dr. Phyllis C. Zee⁵, Zoltan Torontali³

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 7

Abstract | Résumé

Introduction: Low-sodium oxybate (LXB; Xywav[®]) contains the same active moiety as sodium oxybate (SXB; Xyrem[®]), but with 92% less sodium. LXB, administered twice nightly as equal or unequal doses, is approved by the US Food and Drug Administration for treating cataplexy or excessive daytime sleepiness in patients ≥ 7 years of age with narcolepsy and by Health Canada for treating cataplexy in patients with narcolepsy. Real-world data regarding treatment individualization/dosing strategies in patients transitioning to LXB from SXB are limited.

Methods: Transition Experience of persons with Narcolepsy taking Oxybate in the Real-world (TENOR; NCT04803786) was a patient-centric, prospective, observational, virtual-format study of US adults with narcolepsy (type 1 [NT1]/type 2 [NT2]) transitioning to LXB from SXB. Longitudinal data, including physician-directed individualized dosing strategies and reasons for unequal dosing, were collected during transition and 21 weeks post-transition and via participant-completed diaries and questionnaires.

Results: Mean (SD) age of TENOR participants (N=85; NT1, n=45; NT2, n=40) was 40.3 (13.0) years; most were female (73%) and White (87%). Seventeen participants (20%) reported unequal dosing (NT1, n=7; NT2, n=10). Nine (11%) and 1 (1%) among those taking SXB at baseline (n=82), 7 (9%) and 2 (2%) immediately following LXB transition, and 8 (12%) and 0 at study end took higher first and second doses, respectively. Participants taking unequal doses who reported dose timing had ≥ 2.5 hours between doses. The most common total nightly doses were 7.5 g (SXB) and 9.0 g (LXB). The most common reasons for unequal dosing were to avoid feeling morning grogginess (SXB, 44%; LXB, 33%), help fall asleep (SXB, 25%; LXB, 13%), and improve sleep quality (SXB, 13%; LXB, 29%). Other reasons included reducing side effects including nausea, insomnia, and anxiety.

Conclusions: These real-world observations may help inform clinical decision-making around individualized dosing strategies in patients with narcolepsy.

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Submission Category | Cat gorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apn e du sommeil et troubles centraux d'hypersomnolence

116 Barriers and Facilitators in Navigating Obstructive Sleep Apnea Care: A Qualitative Study of Primary Care Providers

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 7

Abstract | R sum 

Background:

Obstructive sleep apnea (OSA) is a prevalent, treatable chronic condition that is associated with significant health and societal consequences. Primary care providers (PCPs) often manage OSA with support from sleep specialists, but struggle to navigate a complex system of care. The aim of this study was to identify barriers and facilitators faced by PCPs in providing OSA care, mapped to the various steps in diagnosis and management of OSA.

Methods:

Twenty-one Calgary-based PCPs were interviewed as part of a study evaluating a primary care management pathway for OSA. Secondary analysis, using the Theoretical Domains Framework (TDF), two investigators deductively coded data to identify barriers and facilitators to OSA care. The barriers and facilitators were then mapped onto service delivery steps to create a Service Blueprint. These steps for PCPs included pivotal decisions around screening tools, referrals, and treatment modality and titration.

Results:

Several key barriers and facilitators were identified related to three TDF domains, which were shared amongst all service delivery steps: 1) Knowledge, 2) Social / Professional Role and Identity, and 3) Environmental Context and Resources. Identified barriers included a lack of formal OSA-related training and education, unclear roles among provider groups (PCPs, sleep companies, and sleep specialists), and low patient engagement due to issues of affordability and tolerability of OSA therapy. Identified facilitators included accessible knowledge resources including the OSA Care

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Pathway, a shared self-perception of PCPs as key players in screening for and referring patients with OSA, and availability of sleep testing through sleep companies and sleep centres.

Conclusion:

This study identified several important behavioural factors that influence decision making for PCPs at key clinical service delivery steps of OSA care. The Service Blueprint will help inform future studies in the development of new interventions aimed at enhancing OSA care.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

121 Examining the Association Between Obstructive Sleep Apnea and Total Hippocampal Volumes in a Cognitively Impaired Cohort

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 7

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Abstract | Résumé

Introduction:

With a rapidly growing population of older adults, the prevalence of dementia and cognitive impairment has seen a significant rise. Given the known risks of obstructive sleep apnea (OSA) on cerebrovascular health, we hypothesized that markers of OSA would correlate with reduced hippocampal volumes, specifically in individuals with cognitive impairment due to neurodegenerative, vascular, or mixed (NVM) etiologies but not in those with subjective cognitive complaints.

Methods:

Data from 166 patients seen at the cognitive neurology clinic at Sunnybrook Health Sciences Centre were retrospectively analyzed. Participants underwent polysomnography or home sleep apnea tests, alongside structural brain MRI. They were categorized as those diagnosed with cognitive impairment of NVM etiology (i.e. Alzheimer's disease, mild cognitive impairment, vascular cognitive impairment and dementia, dementia with Lewy bodies, Parkinson's Disease dementia, and/or mixed disease) or with subjective cognitive complaints. Multiple linear regression models examined the association of hippocampal volume with the presence of OSA (defined as an Apnea Hypopnea Index [AHI] ≥ 15 or AHI ≥ 5 and < 15 with an oxygen desaturation $\leq 88\%$) and severity of OSA (as measured by the AHI and time under 90% oxygen saturation [T90%]).

Results:

Both the presence of OSA and T90% were significantly associated with reduced hippocampal volumes in the NVM group. Conversely, no association was observed in the subjective cognitive complaints group. The AHI demonstrated no correlation with hippocampal volumes in either group.

Discussion:

These findings suggest that individuals with cognitive impairment due to NVM etiology experience underlying neurodegenerative processes which increase susceptibility to adverse effects of OSA. The lack of association with the AHI suggests that hypoxic burden, a factor not fully considered by the AHI, may better reflect the neurological complications of OSA. Further research is warranted to explore if interventions targeting hypoxemia in OSA patients could mitigate cognitive decline in this at-risk population.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

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122 Impact of Nocturnal Hypoxia on Ambulatory Blood Pressure in Hypertensive Patients with Sleep Apnea

Mr. Manraj Virk^{1,2,3,4}, Dr. Sheldon Tobe², Ms. Sarah Berger^{1,2,3}, Ms. Alana Byeon^{1,2,3}, Dr. Michelle Hladunewich², Dr. Sachin Pasricha⁵, Dr. Matthew Oliver², Dr. Andrew Lim^{1,2,3,4}, Dr. Frances Chung^{4,5,6}, Dr. Vijay Chauhan^{4,5}, Dr. Mark Boulos^{1,2,3,4}

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 7

Abstract | Résumé

Background: Obstructive sleep apnea (OSA) is linked to hypertension, as repeated airway collapses lead to intermittent hypoxia, activating the sympathetic nervous system and raising blood pressure, potentially causing nighttime surges.

Objective: This study investigates relationships between nocturnal hypoxia, 24-hour ambulatory blood pressure (ABP), and heart rate (HR) in patients with and without OSA.

Methods: Hypertensive patients underwent 24-hour ABP monitoring and sleep studies, which allowed for assessment of hypoxia (i.e. total sleep time with oxygen saturation <90% (TST90) and lowest oxygen saturation (LowO₂). OSA was defined as an Apnea-Hypopnea Index (AHI)>5 events/hour. Linear regression examined associations between markers of hypoxia (i.e. TST90 and LowO₂) with systolic/diastolic blood pressure (SBP/DBP) in patients with and without OSA while controlling for the effect of age.

Results: We examined 40 patients (mean 59.9 years of age, 69% male, BMI 28.6 kg/m²). Fifteen patients were diagnosed with OSA (mean 65.1 years of age, 62% male, BMI 29.4 kg/m², mean AHI of 21.9 events/hour) and 10 did not have OSA (mean 53.9 years of age, 67% male, BMI 25.8 kg/m², mean AHI 2.3 events/hour). In patients with OSA, LowO₂ was significantly associated with Asleep DBP ($\beta = 0.903$, 95% CI [0.070, 1.735], $p = 0.036$), while no significant associations were found between TST90 or LowO₂ with other ABP measures. No significant associations were found between TST90, LowO₂, and ABP measures in non-OSA patients.

Conclusion: Nocturnal oxygen levels, particularly LowO₂, were linked to elevated Asleep DBP in hypertensive OSA patients, suggesting a relationship between oxygen saturation and

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cardiovascular dysregulation. Further research is warranted to clarify nocturnal oxygen's role in the OSA-hypertension connection.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

125 Utilising a Participatory Co-Design Approach to Develop Sleep Resources for Young Shiftworkers

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 7

Abstract | Résumé

Introduction: Young adults (18-25 years) are participating in shiftwork with increasing frequency, exposing them to elevated health, wellbeing, and safety risks. Early intervention with tailored, evidence-based resources on the health areas most affected by shiftwork - sleep, nutrition, and physical activity - are needed to mitigate these risks. By embedding lived experience voices in resource design and development, high-quality tailoring can be achieved, thereby improving resource implementation amongst young shiftworkers. To date, such participatory, co-design approaches are yet to be implemented in health resource development for shiftworkers.

Methods: Sleep, nutrition, and physical activity resources were created using participatory approaches engaging multidisciplinary co-designers (young, experienced, and previous shiftworkers, workplace health and safety specialists, science communicators, and academic experts). Co-designers ($n=48$) participated in a series of online workshops and questionnaires, and following resource development, assessed their participation and project outputs through online questionnaires, including completion of the Public and Patient Engagement Evaluation Tool (PPEET).

Results: Co-designers successfully developed tailored sleep, nutrition, and physical activity resources for young shiftworkers in the form of a website, pictorial infographics, and an animated

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video. Evaluation indicated that co-designers had positive participatory experiences, with a mean rating across all PPEET items of >4.7 on a 5-point Likert scale, and reporting that the majority (88.1%) of their input was captured and actioned by researchers. Co-designers also evaluated the resources favourably, with the majority (91.9%) indicating that they were user-friendly, valuable, and informative, and would serve as a credible source of health information for young shiftworkers.

Discussion: Novel participatory approaches facilitated the successful co-design of sleep, nutrition, and physical activity resources for young shiftworkers. Based on the positive responses of co-designers, participatory approaches should be implemented when developing health interventions for shiftworkers, allowing for the voices of lived experience to inform outputs targeted at this sleep vulnerable population.

Submission Category | Cat gorie de soumission

Sleep and occupational health and safety | Sommeil et la sant  et s curit  au travail

127 Upper Airway Physiology in Obstructive Sleep Apnea Among Non-Obese Multiple Sclerosis Patients

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 7

Abstract | R sum 

Introduction: The prevalence of obstructive sleep apnoea (OSA) in multiple sclerosis (MS) patients is comparable to the general population, yet many MS patients lack typical OSA risk factors, such as obesity. Many are women, a group generally less affected by OSA, and may have impaired upper airway muscle responses, increasing their risk of airway closure. This study's primary aim was to compare the genioglossus (main upper-airway dilator muscle) reflex response to negative pressure in non-obese MS patients with and without OSA. Secondary objectives included assessing differences in upper airway collapsibility and brainstem lesion burden.

Methods: In this case-control physiology study, we measured upper airway collapsibility and genioglossus reflex responses in non-obese adults with MS, comparing those with and without OSA. MS severity was assessed using the Expanded Disability Status Scale (EDSS) and MRI. OSA was monitored at home for one week (Withings) to estimate the apnoea-hypopnea index (AHI).

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Airway pressure sensors were placed at the choanae and epiglottis, while bipolar fine wires measured genioglossus electromyography. A nasal mask connected to a custom circuit applied brief suction pulses (~250ms, -12cmH₂O) every 2-10 breaths during wakefulness. Baseline EMG was calculated as the mean genioglossus activity 100ms before each stimulus. The upper airway collapsibility index (UACI) was calculated from the pressure difference between choanal and epiglottic readings during suction pulses.

Results: Twenty MS patients (7 males, age 47.2±13 years, BMI 25±3 kg/m²) were studied; 45% had OSA (AHI >10 events/h). BMI did not differ between OSA and non-OSA participants. Genioglossus reflex onset latency, excitation latency, and peak amplitude showed no systematic difference, but upper airway collapsibility was higher in OSA patients (48±34% vs. 20±24%).

Conclusions: Preliminary findings suggest non-obese MS patients have a high OSA prevalence. Although dilator muscle function was similar, increased airway collapsibility was observed in MS patients with OSA.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

133 Treatment Strategies for Postoperative Management of Obstructive Sleep Apnea: A Systematic Review and Meta-Analysis Informing SASM-SAMBA-SOCCA Tri-Society Guidelines

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 7

Abstract | Résumé

Background: Obstructive sleep apnea (OSA) has a high prevalence and is associated with adverse perioperative outcomes.^{1,2} We conducted a systematic review and meta-analysis of published literature evaluating treatment strategies for postoperative management of patients with OSA.

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Methods: A comprehensive literature search was conducted across multiple databases from inception to October 11, 2024. Studies published in English, including adult patients undergoing non-cardiac surgeries that evaluated postoperative treatment strategies for OSA were included. Interventions included postoperative positive airway pressure (PAP) therapy, oxygen, high-flow nasal oxygen (HFNO) and positional therapy. Risk of bias (RoB) was assessed using Cochrane RoB 2 and ROBINS-I tools. Data was pooled using a random effects model to generate odds ratios (OR), mean differences (MD) and 95% confidence intervals (95%CI). Certainty of evidence, and strength of recommendations followed the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach.³

Results: The search retrieved 18638 articles, with 25 observational cohort studies and 3 randomised controlled trials included (PAP=20, oxygen=4, HFNO=1, positional=2). Most studies were at low risk of bias. Compared to controls (no treatment), AHI was reduced following treatment with PAP therapy (MD -13.06[95 %CI -18.85, -7.26]), oxygen (MD -15.30[95%CI-21.57, -9.03]), HFNO (MD-11.00 [95%CI -20.92, -1.08]) and positional therapy (MD -14.01[95%CI-20.55, -7.47]). PAP was associated with a reduction in unplanned ICU admissions (OR 0.41[95%CI 0.20-0.84]). Quality of evidence was low to moderate certainty, and was downgraded for observational study design, inconsistency, and imprecision.

Conclusion: Based on available evidence, we recommend use of PAP (low to moderate certainty, strong for recommendation) as first line treatment. We suggest use of HFNO, oxygen, and positional therapy (low certainty, conditional for recommendation), which may be considered when PAP is unavailable, poorly tolerated and patients monitored for change in respiratory status. Clinical judgment should be used to tailor interventions to individual patient circumstances.

Submission Category | Cat gorie de soumission

Dental and surgical sleep medicine | M decine dentaire et chirurgicale du sommeil

195 Primary Care Provider Perspectives on a Clinical Pathway for Obstructive Sleep Apnea

Dr. Sachin Pendharkar¹, Mr. Kenneth Blades¹, Ms. Michelle Cheng¹, Dr. Alyssa Lip¹, Dr. Hannah Yaphe¹, Dr. Kerry McBrien¹, Dr. Ward Flemons¹, Mr. Reg Gerlitz², Dr. Jaana Woiceshyn¹, Dr. Gabriel Fabreau¹, Dr. Willis Tsai¹, Dr. Marcus Povitz¹, Dr. Oliver David¹, Dr. Maoliosa Donald¹

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ORAL SESSION AND POSTER ASSIGNMENTS

ORAL SESSION 7

Abstract | R sum 

Introduction: Primary care providers (PCPs) increasingly provide obstructive sleep apnea (OSA) care but face several barriers. We co-designed an online, evidence-based pathway to support

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primary care OSA management. This study aimed to evaluate the pathway's usability and PCP perspectives on its value in clinical practice.

Methods: We recruited Calgary PCPs to participate in an online survey, semi-structured interviews and usability testing through primary care newsletters, established networks and social media. The survey explored PCPs' awareness and use of the pathway, its impact on knowledge, confidence in managing OSA, and specialist referral. Thematic analysis of interviews utilized the Theoretical Domains Framework to understand barriers and facilitators of pathway use and whether it helped mitigate existing barriers to care. We performed usability testing through five example cases designed to highlight key decision points around appropriate use of testing, OSA treatment, and specialist referral for complex patients.

Results: We received 95 survey responses, revealing that 69% were unaware of the pathway. Those who had used the pathway found it helpful to improve OSA knowledge and confidence in management. Respondents agreed OSA should be managed in primary care (45/59; 76%), but only 53% of respondents reported sufficient resources to do so, and 25% referred over half of their OSA patients to specialists. Interviews revealed that PCPs valued unbiased guidance on various aspects of OSA screening, diagnosis and management, and information about related issues such as driving safety or management of other sleep disorders. The development of accompanying patient education materials was suggested to further add value. Usability testing revealed several pathway modifications to better align it with PCP clinical workflow.

Discussion: While PCPs were generally unaware of the OSA clinical pathway, they saw its value in supporting person-centred OSA care. Successful implementation will require user-centred pathway refinement, marketing and co-design of patient-oriented educational tools.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

POSTER SESSION 1

4 Sleep Duration and Quality Trajectories During the Early Days of the Covid-19 Pandemic: A Canadian Nationally Representative Study

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Poor sleep health has wide-ranging consequences for health. Studies conducted worldwide during the first wave of the COVID-19 pandemic reported sleep changes that were not reflected in Canadian studies. However, none were representative of the Canadian population. To assess pandemic-induced health disruptions, we investigated sleep health trajectories and health correlates during the first wave of COVID-19 in a longitudinal nationally representative sample of Canadians. We aimed (1) to determine the trajectories of sleep duration and sleep quality, (2) to identify health factors associated with unstable sleep trajectories, and (3) to explore associations between sleep trajectory groups.

A nationally representative sample of 2,246 individuals residing in Canada was surveyed 6 times between April and July 2020. Participants reported on their sleep and health-related factors (e.g., sociodemographic factors). We first used latent class growth analysis to identify sleep trajectories. We then used multinomial logistic regression models to determine the relationships between health-related predictors and trajectory groups. Finally, we used a joint trajectory analysis to explore the relationships between sleep duration trajectories and sleep quality trajectories. We identified four constant sleep quality trajectories (6.7%, 37.1, 45.5%, and 10.7% of the sample). We identified two sleep duration trajectories, one of stable short sleep (33.9%), and one of decreasing (-2.32 min/2 weeks) long sleep (66.1%). Living with someone predicted longer and decreasing sleep duration. Being 25 or older was associated with a lower likelihood of belonging to the longer and decreasing sleep duration trajectory. There was a 98.9% likelihood of belonging to the longer and decreasing sleep duration trajectory for those belonging to the higher sleep quality trajectory.

In our study, we found no convincing evidence that sleep health indicators deteriorated during the first wave of COVID-19 in Canada. The overall stability of sleep suggests that sleep is likely governed by factors that remained stable.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

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9 Effect of Daridorexant on Sleep Micro-Architecture in Adult Patients With Insomnia Disorder – a Post-Hoc Analysis of Two Pooled Phase 3 Studies

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction Insomnia shows impaired sleep micro-architecture and sleep continuity. The orexin system may play a role in the associated hyperarousal state. This research hypothesizes that aspects of sleep micro-architecture pertaining to the hyperarousal state may be improved by the dual orexin receptor antagonist daridorexant.

Methods Data from patients randomized to placebo (n=615), daridorexant 25mg (n=618) and 50mg (n=308) were extracted from two phase 3 studies (NCT03545191; NCT03575104). Baseline and 3-month data were calculated from two consecutive polysomnography nights. Sleep-stage transition probabilities were assessed using a first-order Markov model. Micro-architecture was evaluated using spectral analysis of the EEG. Spectral power density was estimated using multi-taper spectral density estimation. EEG spectral bands were analyzed: delta (1–4 Hz), theta (4–8 Hz), alpha (8–12 Hz), and beta (12–30 Hz). Relative power was computed for each band relative to the sum of all four band powers. The relative and band power ratios were calculated for each annotated 30s epoch and aggregated by sleep-wake stage.

Results Daridorexant 50mg significantly decreased transitions from sleep to Awake and increased transitions from Awake to N1, N2, and REM, and N1 to N2, from baseline to month 3 versus placebo. At month 3, daridorexant 50mg significantly reduced relative alpha and increased relative delta power in Awake and decreased relative beta in both Awake and N1 versus placebo. Effects

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were less pronounced with daridorexant 25mg. Relative spectral power in N2, N3 and REM at month 3 did not differ versus placebo. No significant treatment effect was observed on sleep spindles.

Conclusions Daridorexant reduced transitions from sleep to Awake, promoted transitions from Awake to N1 and N2, and reduced relative power in spectral bands associated with vigilance and wakefulness. These findings are consistent with a decrease in the insomnia hyperarousal state and support the effect of daridorexant on the pathophysiological features of insomnia.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

17 Sleep Medicine Resource Utilization in Individuals With Parkinson's Disease: A Population Study of Health Administrative Data

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Background:

Individuals with Parkinson's disease (PD) may face barriers in obstructive sleep apnea (OSA) diagnosis and management due to sleep being lower priority, and sleep disturbances being poorly recognized. Evidence on sleep medicine service utilization in the PD population is lacking.

Methods:

We conducted a longitudinal population-based study using health administrative databases in Ontario from 2012–2021 in adults with PD to compare overall and annual prevalence rates of polysomnograms (PSGs) performed and positive airway pressure (PAP) treatments initiated (claimed) to the propensity score matched (by calendar year, sociodemographic variables and comorbidities) non-PD general population. We hypothesized that the PD population has lower

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rates of PSGs performed and PAP treatments initiated compared to the similar general population. We used Poisson regression to estimate annual prevalence rate ratios to determine the relative change in prevalence over the study period between the groups. We used a validated definition to identify the PD population from administrative data.

Results:

65,167 PD patients and 11,460,672 controls met our inclusion criteria. We successfully propensity score matched 64,879 PD cases to controls. From 2012-2021, there was a higher prevalence of any PSG performed in the PD population (8.2% vs 6.3%, $p<0.001$) and no difference in the rates of any PAP initiated in the PD population vs controls (4.0% vs 4.1%, $p=0.46$). For both the control and PD groups, the annual prevalence rates generally increased over time. There was no difference in the annual prevalence rate ratio of any PSG performed or any PAP initiated in the PD population vs controls (1.07 [95% CI:1.06-1.07] vs 1.07 [95% CI: 1.07-1.08], $p=0.5$; 1.10 [95% CI:1.09-1.11] vs 1.11 [95% CI: 1.10-1.11], $p=0.18$, respectively).

Discussion:

Sleep medicine resource utilization in the PD population is at least similar to the general population and follows the increase with time observed in the general population.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

23 Sleep and Pharmacotherapy in Treatment-Resistant Late-life Depression: Findings from the OPTIMUM Clinical Trial

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Adults with treatment-resistant late-life depression (TRLLD) have high rates of sleep problems; however, little is known about the occurrence and change in sleep during pharmacotherapy of TRLLD. This analysis examined: (1) the occurrence of insufficient sleep among adults with TRLLD; (2) how sleep changed during pharmacotherapy; and (3) whether treatment outcomes differed among participants with persistent insufficient sleep, worsened sleep, improved sleep, or

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persistent sufficient sleep.

Secondary analysis of data from 634 participants age 60+ years in the OPTIMUM clinical trial for TRLLD. Sleep was assessed using the sleep item from the Montgomery-Asberg Depression Rating Scale at the beginning (week-0) and end (week-10) of treatment. The analyses examined whether treatment outcomes differed among participants with persistent insufficient sleep, worsened sleep, improved sleep, or persistent sufficient sleep during depression treatment.

About half (51%, n = 323) of participants reported insufficient sleep at baseline. Both persistent insufficient sleep (25%, n = 158) and worsened sleep (10%, n = 62) during treatment were associated with antidepressant nonresponse. Participants who maintained sufficient sleep (26%, n = 164) or who improved their sleep (n = 25%, n = 158) were three times more likely to experience a depression response than those with persistent insufficient sleep or worsened sleep.

Insufficient or reduced sleep are modifiable factors that may improve treatment outcomes in TRLLD. Given that sleep complaints including insomnia are associated with greater risk of depressive relapse and treatment non-response, a tailored treatment plan for those at greatest risk of sleep disturbance with concomitant depression may facilitate better outcomes.

Submission Category | Catégorie de soumission

Sleep, dreams and mental health | Sommeil, rêves et santé mentale

24 A Dopamine-Histamine Circuit Controls Arousal in Mice

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University of Toronto, Toronto, Ontario, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Dopaminergic agents, such as modafinil, are commonly prescribed to patients struggling with daytime sleepiness, highlighting dopamine's key role in wakefulness regulation. Despite the widespread use of these agents, the specific dopaminergic circuits involved in wakefulness control remain understudied. Prior work in our lab revealed that dopamine neurons in the A11 hypothalamic nucleus control wakefulness. It contains the highest proportion of wake-on dopamine cells compared to other dopaminergic nuclei, and activation of these cells promotes arousal. However, *how* A11 cells communicate with their downstream targets to promote wakefulness remains unknown. Here, we hypothesize that the A11 neurons modulate wakefulness through interactions with the histamine neurons of the tuberomammillary nucleus (TMN), a well-established wake-promoting region.

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Using a genetically encoded dopamine sensor (i.e., GRAB DA), we found that dopamine release onto the TMN is highest during wakefulness and lowest during sleep (n=3). Additionally, we found that optogenetic activation of the A11 axonal projections in the TMN prolonged periods of wakefulness by 67% compared to their own baseline recordings (paired t-test, $p < 0.05$, n = 7) or control groups (unpaired t-test, $p < 0.05$, n = 5). Through cFos staining, we found that manipulation of these dopaminergic projections increases the activity of histamine cells in the TMN (n = 4).

These results suggest that A11 dopamine projections to the TMN modulate wakefulness, primarily by lengthening wakefulness episodes. By identifying the underlying mechanisms of this circuit, future work might help develop more effective and region-specific pharmacological treatments for sleep disorders, such as insomnia.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

30 Galanin Receptor 1 Mediates the Inhibitory Effects of Galanin on Wake-Active Histaminergic Neurons

Ms. Axelle Khouma^{1,2}, Ms. Albane Chabot-Chartier¹, Ms. Julie Plamondon¹, Dr. Alexandre Caron^{1,2}, Dre. Natalie Jane Michael^{1,2}

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Galanin is an important neuropeptide contributing to the regulation of sleep and wakefulness. Activation of galanin neurons in the ventrolateral preoptic area (VLPO^{GAL}) promotes sleep and increases non-rapid-eye-movement (NREM) sleep. Evidence suggests that some of the sleep-promoting effects of galanin and VLPO^{GAL} neuron activation may be due to their ability to inhibit the wake-promoting histaminergic neurons of the tuberomammillary nucleus (TMN). However, the mechanisms by which galanin influences histaminergic neuron activity remain poorly defined. Here, we used whole-cell patch clamp electrophysiology experiments to characterize the galanin-induced inhibition of genetically identified histaminergic neurons. Whole-cell current clamp recordings were established from histaminergic neurons expressing a red fluorescence protein, using a histidine decarboxylase (*Hdc*)-cre mouse model. Bath application of galanin (100nM) strongly inhibited the electrical excitability of histaminergic neurons. The galanin-induced inhibition of histaminergic neurons was associated with a significant hyperpolarization of the membrane potential and a significant decrease in firing frequency. Galanin receptor 1 (GAL1R)

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agonist M617 (500nM), but not galanin receptor 2 (GAL2R) or galanin receptor 3 (GAL3R) agonists (M1145, 200nM and spexin, 1µM, respectively), mimicked the galanin-induced inhibition. Synaptic inhibitors blocking glutamatergic and GABAergic transmission (CNQX 10µM, AP5 50µM and picrotoxin 50µM) were also utilized. In the presence of these synaptic blockers, the GAL1R agonist M617 continued to inhibit histaminergic neurons. RNAScope® *in situ* hybridisation performed on hypothalamic brain slices containing the TMN revealed strong *Gal1r* expression in histaminergic (*Hdc* expressing) neurons. Together, these results suggest that GAL1R expressed on histaminergic neurons mediates the inhibitory effects of galanin on these neurons. This data also supports the notion that the sleep-promoting effects of VLPO^{GAL} neuron activation may occur via galanin's ability to inhibit the wake-promoting histaminergic neurons.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

34 Effect of Positional Therapy on the Sleep Apnea-Specific Hypoxic Burden and Pulse Rate Response in Children with positional Obstructive Sleep Apnea

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Background: Both elevated sleep apnea-specific hypoxic burden (HB) and pulse rate response (Δ HR) are associated with an increased risk of cardiovascular morbidity and mortality in adults with obstructive sleep apnea (OSA). This study aimed to examine the effect of single-night positional therapy on HB and Δ HR in children with positional OSA. We hypothesized that HB and Δ HR could be reduced after positional therapy.

Materials and Methods: This was a secondary analysis of a crossover randomised controlled trial that examined the effect of positional therapy on OSA severity in children with positional OSA. Children aged between 4-18 years diagnosed with positional OSA at sleep study were recruited. Participants underwent two nights of additional sleep studies, one with active therapy (positional device with inflated cushions), and the other with control therapy (position devices with no cushions). They were randomized to receive either active or control therapy first.

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Results: 24 participants [15 males (63%), median(IQR) age: 9.0 (7.0–14.3) years] were enrolled, of whom 9 were randomized to receive active therapy first. Despite a significant reduction in supine sleep time [10.2% (IQR 0 - 21.6) vs. 41.6% (IQR 25.5 - 69.1)] was observed in the night of active therapy compared to the control therapy, there were no significant differences in HB [63.2 %min/h (SE 20.3) vs. 81.8 %min/h (SE 21.9), $p=0.11$] or Δ HR [17.6 BPM (SE 1.4) vs. 19.6 BPM (SE 1.7), $p = 0.13$] between the two nights.

Conclusions: In children with positional OSA, no significant reductions in HB and Δ HR could be observed following positional therapy despite significant reduction in supine sleep time. Further studies with larger sample sizes are needed to identify which subtypes of OSA respond best to positional therapy.

Acknowledgements: This study was supported by Physicians' Services Incorporated (PSI) Foundation.

Submission Category | Cat gorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apn e du sommeil et troubles centraux d'hypersomnolence

36 Effects of Solriamfetol on Cognition in Obstructive Sleep Apnea With Excessive Daytime Sleepiness and Impaired Cognition in the SHARP Clinical Trial

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | R sum 

Introduction: This analysis evaluated the effect of solriamfetol (Sunosi[ ]), approved to treat excessive daytime sleepiness (EDS) associated with obstructive sleep apnea (OSA; 37.5–150 mg/day), on subjective cognitive function by examining overall scores and individual items of the British Columbia-Cognitive Complaints Inventory (BC-CCI).

Methods: SHARP was a randomized, double-blind, placebo-controlled, crossover trial in participants with impaired cognition associated with OSA and EDS. Participants received solriamfetol (75 mg for 3 days, then 150 mg/day), and placebo, each for 2 weeks, with a 1-week

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washout. BC-CCI items included forgetfulness/memory problems, slow thinking speed, trouble expressing thoughts, trouble finding the right word, poor concentration, trouble figuring things out, and vocational, family/friends, and social/recreational functioning. Changes from baseline were assessed using mixed models with repeated measures.

Results: SHARP enrolled 59 participants (mean±SD age 52.2±10.7y; 36% female). Baseline overall BC-CCI scores were 11.4±2.5; scores were comparable between solriamfetol/placebo (n=30; mean=11.4) and placebo/solriamfetol (n=29; mean=11.4) sequences. Overall BC-CCI scores improved with solriamfetol versus placebo ($P=0.002$; Cohen's $d=0.45$). Baseline individual BC-CCI items scores were generally similar between sequences. Solriamfetol led to greater improvements compared with placebo in poor concentration ($P=0.007$; $d=0.37$), slow thinking speed ($P=0.009$; $d=0.36$), trouble finding the right word ($P=0.042$; $d=0.28$), trouble figuring things out ($P=0.030$; $d=0.30$), and forgetfulness/memory problems ($P=0.013$; $d=0.34$). No significant differences were found for functional items.

Conclusion: Consistent with previously observed improvement on objective cognition, solriamfetol led to significant subjective improvements overall, and particularly in domains related to memory, executive functioning, and processing speed.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

38 Optimizing Biomathematical Models of Fatigue for Predicting Performance in Military Operational Environments

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

Introduction: Biomathematical models of fatigue (BMMF) predict fatigue risk based on factors such as sleep history and time of day. Few studies have examined their application in military operational environments for predicting performance in tasks of varying difficulty. This study assessed the adequacy of a BMMF (2-B alert) in the training of special operations troops and its predictive value for marksmanship. **Methods:** Twenty-six subjects were analyzed over five days under varying sleep conditions. The model's fit to alertness predictions was evaluated using the original parameters reported in the literature, as well as after applying non-linear optimizations (Nelder-Mead) with group data and individual data. Also, Bayesian learning (BL) and an Extended Kalman Filter (EKF) were used for a real-time, individual-level optimization. Finally, the model's ability to predict performance in the marksmanship tests was assessed, including difficulty and fatigue prediction as fixed factors in a linear mixed-effects model. **Results:** The original model had an RMSE of approximately 50 ms for alertness predictions, while the other models showed RMSEs below 20 ms. The EKF adjusted model explained 18% ($p < 0.001$) of marksmanship variance (task difficulty: 9%, $p < 0.001$; fatigue: 1%, $p = 0.014$). When categorizing the variables, it was observed that, under high task difficulty, a response time of more than 250 ms was associated with poorer performance (AUC: 0.74 [0.68-0.80], Sensitivity: 0.72, Specificity: 0.68, Positive Predictive Value: 0.74, Negative Predictive Value: 0.66). **Discussion:** The main finding showed that optimizing the parameters based on field alertness tests provided more accurate predictions than using parameters reported in the literature. Additionally, we found that fatigue explained a small but significant proportion of the variance. Overall, these preliminary results will help in developing personalized strategies for managing fatigue and performance across different contexts.

Submission Category | Catégorie de soumission

Sleep and occupational health and safety | Sommeil et la santé et sécurité au travail

42 Investigating How Sleep and Pain Are Related in Inflammatory Bowel Disease

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Background and Aim: Inflammatory bowel disease (IBD) is a gastrointestinal disease with a chronic course characterized by remissions and relapse. Even when disease activity is well managed, individuals with IBD still experience sleep disturbance and pain. The aim of the current study was to understand how sleep and pain are related in IBD.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Methods: Data was collected as part of the IMAGINE network's MAGIC study. Adult participants with IBD ($n = 487$) completed study measures (i.e., sleep disturbance, pain) yearly for four years. Parallel process latent growth modelling (LGM) examined how sleep disturbance and pain were related over four time points.

Results: The model showed good fit on both absolute (RMSEA = .04, SRMR = .02) and incremental (CFI = .99, TLI = .99) fit indices. Higher baseline sleep disturbance was associated with higher baseline pain. Baseline sleep disturbance and pain were not associated with changes in sleep or pain. However, steeper decreases in sleep disturbance were associated with steeper decreases in pain. Due to preliminary differences in pain by disease state, a second model included disease state as a time varying covariate. The conclusions drawn from the second model did not differ from the original LGM model.

Conclusions: As expected, sleep disturbance and pain were interconnected with significant associations between mean baseline scores and changes across time. However, sleep disturbance did not precede changes in pain, suggesting a reciprocal relationship where sleep disturbance and pain may perpetuate one another over time. The relationship was consistent regardless of disease state.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

45 The Association Between Low Back Pain and Sleep Quality in Adults 60 Years and Older: A Systematic Review

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

Background

Poor sleep quality is a health concern in the aging population, and little is known about its etiology. One hypothesized risk factor for poor sleep quality in aging adults is low back pain (LBP). We aimed to synthesize evidence on the association between LBP and sleep quality among adults ≥ 60 years.

Methods

We conducted a systematic review of the literature. We registered our protocol with OSF (#u7bc4) and reported our review according to the 2020 PRISMA statement. We searched MEDLINE, Embase, CINAHL, and PsycINFO from inception to April 2024. We included cross-sectional, cohort, and case-control studies on the association between LBP and sleep quality among adults ≥ 60 years published in English, French, Chinese and Portuguese. Two independent reviewers screened citations and critically appraised the quality of eligible studies using the JBI checklists. We descriptively synthesized the evidence from low and moderate risk of bias studies.

Results

Our search retrieved 2052 articles. After removing duplicates, we screened 1917 citations for eligibility. 186 studies were eligible for full-text screening and 12 (11 in English and one in Chinese) were critically appraised. We synthesized six articles with low and moderate risk of bias (5 cross-sectional and 1 cohort). One cross-sectional study reported a negative association between back pain and sleep problems ($OR=0.9$). Two cross-sectional studies reported a positive association between back pain and sleep quality with OR ranging from 1.17- 1.68 and two reported OR s ranging from 1.12-1.4 for back pain and disturbed sleep. One cohort study reported a positive association between LBP-related numeric rating scale and sleep quality measured by PSQI ($\beta= 0.14$).

Conclusion

Our review suggests that LBP is associated with sleep quality in adults ≥ 60 years. Our findings are primarily from cross-sectional studies highlighting the need for cohort studies better to understand the relationship between LBP and sleep quality.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

49 Potential Discrepancies in Participant and Physician Perceptions of Narcolepsy Symptoms

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction: Narcolepsy medications reduce symptom frequency, but approximately 50% of patients report residual daily symptoms. The **Chart REview of the Assessment and TrEatment of Patients with Narcolepsy (CREATE)** project evaluated patient and physician perceptions of symptoms and their frequency in individuals with narcolepsy in Canada.

Methods: CREATE comprised practice profiles provided by 6 sleep specialists (including information about their practice, such as years of experience), a survey, and retrospective chart reviews. Eligible participants chosen by participating sleep specialists were >18 years of age, diagnosed with narcolepsy, and taking medications to treat the disorder; they were excluded if language barriers existed or informed consent was not provided. The survey was administered online, allowing responses to be evaluated independently, with participants receiving similar questions as the physicians.

Results: Of the 53 participants whose charts were reviewed, 43 (81.1%) completed the survey. Excessive daytime sleepiness (EDS) and disrupted nighttime sleep (DNS) were the symptoms that most affected the participants. Participants reported that EDS impacted them daily (41.9%), weekly (27.9%), monthly (7.0%), rarely (14.0%), or never (9.3%). Physicians reported that EDS impacted participants daily (15.1%), weekly (30.2%), monthly (17.0%), rarely (32.1%), or never (5.7%). Participants reported that DNS impacted them daily (25.6%), weekly (27.9%), monthly (9.3%), rarely (30.2%), or never (7.0%). Physicians reported that DNS impacted participants daily (7.5%), weekly (24.5%), monthly (13.2%), rarely (34.0%), or never (20.8%). Participants and physicians were generally aligned on the frequency of cataplexy, hallucinations, and sleep paralysis. Similar patterns of perceptions of EDS and DNS for participants and physicians were observed for participants with narcolepsy type 1 or type 2.

Conclusion: In CREATE, patients reported residual symptoms that exceeded physicians' awareness in this small sample. A better understanding of this divide is crucial for improving communication and optimising treatment effectiveness. Additional research is needed to confirm these findings.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

51 Brainstem Pathways Involved in the Pathogenesis of REM Sleep Behaviour Disorder and Prodromal Parkinson's Disease

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction: Parkinson's disease (PD) is preceded by REM sleep behaviour disorder (RBD). This disorder results from the accumulation of α -synuclein (α syn) pathology in the brainstem circuit that regulates REM sleep (i.e., the sublaterodorsal nucleus (SLD) \rightarrow ventral medulla (vM) circuit). However, how pathology initially arises in this circuit remains unclear. It is hypothesized that pathology propagates from gut to brain via the dorsal vagal nucleus (DMV), but it is unknown if pathology subsequently invades the REM sleep circuit to cause RBD. Here, we explore in mice whether the caudal-rostral spread of pathology in brainstem circuits underlies progression from prodromal to clinical stages of PD.

Methods: Tract tracing was performed to map neural pathways between the DMV and the REM sleep circuit. To model PD, α syn preformed fibrils (PFFs) were injected into the DMV of wild-type mice (n=18). Comparisons were made with age-matched controls and mice with PFFs directly injected into the vM (n=14). Histological and behavioral analyses were used to evaluate neurodegeneration and the development of RBD and PD symptoms in PFF-injected mice.

Results: 1) Tract tracing revealed monosynaptic connections between the DMV and vM, and bidirectional connectivity between the SLD and vM. **2)** vM PFF inoculation induced widespread α syn pathology by 9-10 months, with neuronal loss in the REM sleep circuit ($p < 0.01$) and the substantia nigra ($p < 0.01$). **3)** DMV-inoculated mice exhibited limited brain pathology and minimal loss of SLD neurons. **4)** These divergent patterns of pathology corresponded with distinct phenotypes: vM-inoculated mice developed RBD-like behaviours from 3-9 months ($p < 0.01$) and PD-like motor deficits at 8-10 months ($p < 0.05$), whereas DMV-inoculations only showed gastrointestinal deficits at 9-10 months ($p < 0.05$).

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Conclusion: Our findings show that the outcomes of α -syn pathology are constrained by its site of initiation. While α -syn pathology drives progression from RBD to PD, questions about its origins remain.

Submission Category | Cat gorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurod g nescence

59 Hallucinations as a Risk Factor of Dementia in Parkinson’s Disease Patients With REM Sleep Behavior Disorder

Mariko Tr panier Maurais^{1,2}, Jessie De Roy^{1,2}, Coline Zigrand^{1,2}, Dr. Ronald B. Postuma^{1,3}, Dr. Jacques Montplaisir^{1,4}, Dre. Isabelle Rouleau², Dr. Jean-Fran ois Gagnon^{1,2}

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | R sum 

Parkinson’s disease (PD) is a progressive neurodegenerative disorder characterized by a combination of motor and non-motor symptoms. Sleep disturbances and neuropsychiatric symptoms are frequent in PD, affecting up to 90% of patients, even in the earliest stages of the disease. Both motor and non-motor symptoms can precede the clinical diagnosis by several years, gradually worsening over time. Rapid eye movement (REM) sleep behavior disorder (RBD), a parasomnia, is one of the strongest risk factors of dementia in this population. However, considerable heterogeneity exists in the onset and progression of cognitive decline among patients. This study aimed to better characterize the progression of neuropsychiatric symptoms in the prodromal phase of dementia in PD patients, with and without RBD.

A cohort of 78 PD patients was recruited and categorized into three groups: without RBD who remained dementia-free (nRBD; n=33), with RBD who remained dementia free (RBD-nD, n=23), and with RBD who developed dementia (RBD-D; n=22). Questionnaires measuring symptoms of depression (BDI-II), anxiety (BAI), hallucinations (UPDRS-I2), and apathy (UPDRS-I4) were administered. Comparative analyses were performed using ANOVAs and ANCOVAs, followed by Tukey’s and Bonferroni post hoc tests where applicable. Categorical data were analyzed using chi-square tests.

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RBD-D patients exhibited greater severity of hallucinations (RBD-D > RBD-nD, $p=0.025$; RBD-D > nRBD, $p<0.001$) and a higher proportion of them experienced hallucinations (RBD-D (27%) > RBD-nD (0%), $p=0.008$; RBD-D > nRBD (6%), $p=0.033$). No significant differences were found in symptoms of apathy, depression, or anxiety between groups.

These results highlight hallucinations as a key neuropsychiatric symptom indicative of impending dementia in PD patients with RBD. These findings could aid research on disease-modifying therapies and provide insights into mechanisms of cognitive decline in this population. Further longitudinal studies are crucial to deepen our understanding of the RBD phenotype in PD.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

65 Objective Response to Cognitive Behavioral Therapy in Breast Cancer Survivors: A Case Report

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Background:

Breast cancer survivors have a high prevalence of insomnia. Cognitive Behavioural Therapy for Insomnia (CBT-I) is the recommended treatment for insomnia disorder, but there is limited and inconsistent research using objective measurements like polysomnography to assess treatment outcomes. The present case report describes the sleep outcomes of a 59-year-old breast cancer survivor in response to seven sessions of CBT-I.

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Methods:

Sleep was measured before and after treatment with the Insomnia Severity Index (ISI), sleep diaries, and the Cerebra Sleep System (CSS), an in-home polysomnography device. Total sleep time (TST), sleep onset latency (SOL), wake after sleep onset (WASO), sleep efficiency (SE) was measured using sleep diaries and the CSS. Change in sleep architecture and the Odds Ratio Product was determined using the CSS and reviewed by a registered polysomnography technologist. ORP is a continuous measure of sleep depth and ranges from 0 [deeply asleep] to 2.5 [fully awake].

Results:

Overall, the participant's ISI score decreased by 10 points. According to the sleep diary, TST decreased by 44 minutes, SOL decreased by 16 minutes, WASO decreased by 20 minutes, and SE increased by 4.8%. According to the CSS, TST increased by 163 minutes, SOL decreased by 79 minutes, WASO decreased by 80 minutes, and SE increased by 29.7%. Pre CBT-I treatment, the patient had no REM sleep, which increased to 81.5 minutes post-treatment. Average ORP_{TRT} decreased (i.e., deeper sleep) from 1.6 to 1.2.

Discussion:

This case highlights that objective measures provide novel information about sleep treatment outcomes. Objective measurements improved to a greater extent than self-reports. Time spent in REM sleep and ORP scores improved, which suggests CBT-I may improve sleep architecture. This case supports the use of objective measures of CBT-I treatment response, but controlled research with a larger sample is needed to confirm.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

66 Odds Ratio Product as a Biological Marker of Phenotypes of Insomnia

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction: Research has proposed different phenotypes of insomnia based on a few subjective or objective metrics. This study investigated differences in objective markers of sleep depth and identified phenotypes of insomnia using a person-centered approach with latent class analysis.

Methods: Participants from the community were screened with the Insomnia-Severity-Index and clinical interviews and assigned to control (n=50) or insomnia (n=69) groups. They completed three nights of in-laboratory overnight polysomnography. We measured the Odds Ratio Product (ORP), a continuous measure of sleep depth (0=deep sleep, 2.5=full wakefulness) and calculated: a) ORP in stages Wake, NREM, REM, b) percentage of TRT in deep sleep (ORP<0.5) and full-wakefulness (ORP>2.25), c) number/hour of sleep of transient increases in ORP to wake levels (Wake Intrusion Index; WII), d) gamma power, e) frequency of alpha intrusions, f) speed of return to deep sleep after arousals (ORP-9). We used Latent Class Analysis to differentiate two distinct insomnia groups with “Objectively Normal” and “Objectively Poor” sleep. We compared these two groups and controls on objective markers, using ANCOVA’s, controlling for age.

Results: The Objectively Poor group had higher ORP_{wake}, ORP_{NREM}, ORP_{REM}, %TRT >2.25, gamma power, alpha intrusion, WII, % awake, and ORP-9, than controls and the Objectively Normal group (p’s<.05), illustrating evidence of hyperarousal, while the Objectively Normal group was comparable to controls. Both insomnia groups reported worse sleep (p<.001), and underestimated TST (p<.05), relative to controls, despite similar objective sleep metrics in the Objectively Normal group.

Discussion: Using novel objective sleep metrics, we identified a subgroup of insomnia patients with several abnormalities related to cortical hyperarousal and another with sleep similar to those with no insomnia. Subjective assessment of sleep quality in insomnia was independent of objective sleep quality. Future research could determine whether these groups differ on treatment response and can predict which treatment is the most appropriate.

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Submission Category | Catégorie de soumission

Insomnia | Insomnie

68 Activity of the Lateral Supramammillary Neurons and Their Relation to Theta Activity During REM Sleep.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Rapid Eye Movement (REM) sleep has many defining characteristics, including vivid dreaming, rapid eye movements, muscle atonia, and cortical theta activity (4-12 Hz). The lateral supramammillary nucleus (SuML) has been proposed to regulate cortical theta activity, but the role of this region specifically during REM sleep has remained elusive. We have previously shown that REM sleep-active glutamate neurons of the sublaterodorsal tegmental nucleus (SLD^{Glut}) innervate the SuML. The SuML glutamate neurons further project to the Medial Septum GABA neurons (MS^{GABA}), which form a bi-directional circuit with Hippocampal cells, to generate theta activity. Together, these findings suggested a role for this circuit in REM-specific modulation of theta activity. We recently demonstrated that optogenetic inhibition of the SuML^{Glut} cell bodies, $SLD^{Glut} \rightarrow SuML^{Glut}$ and $SuML^{Glut} \rightarrow MS^{GABA}$ circuits during REM sleep significantly decreased theta power. In addition, we saw that changes in theta power elicited by optogenetic inhibition did not affect REM sleep duration or frequency, and thus did not affect sleep-wake architecture. Here, we aimed to record the activity of SuML^{Glut} neurons during REM sleep to understand how their activity relates to theta activity. To do this, we expressed a calcium indicator (i.e., GCaMP7f) in SuML^{Glut} neurons and used fiber photometry to record the population activity of these neurons. We found that SuML^{Glut} neurons are most active during REM sleep compared to other states (one-way ANOVA, $p < 0.01$, $n = 4$). Additionally, we show an overall increase in the spontaneous calcium activity of SuML^{Glut} neurons during the transition from NREM to REM sleep and an overall decrease during the transition from REM sleep to wakefulness (one-way ANOVA, $p < 0.01$, $n = 4$). Lastly, we demonstrate that theta/delta power correlates with the activity of SuML^{Glut} neurons during REM sleep. Together, our findings support that SuML^{Glut} neurons contribute to the regulation of theta activity during REM sleep.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

73 Lipid-Lowering Medications are Associated with Changes in Sleep Quality

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Background: There is mixed evidence as to whether lipid-lowering medications impact sleep quality.

Objective: We explored the relationship between lipid-lowering medication use and objective measures of sleep quality recorded via in-laboratory polysomnography.

Methods: We examined patients who completed diagnostic in-laboratory polysomnography at the Sunnybrook Sleep Laboratory during 2010-2015. Self-reported questionnaires were used to report patient's use of any lipid lowering medication, the specific class of medication, and medical comorbidities. Multivariable linear regression models were utilized to analyze the association between use of lipid-lowering medications, and their specific classes, with objective measures of sleep (i.e. sleep efficiency, total sleep time, duration of sleep stages, sleep onset latency, and wake time after sleep onset). The medication classes explored included the use of statins (i.e. atorvastatin, pravastatin, rosuvastatin, simvastatin), cholesterol absorption inhibitors, fibrates, bile acid sequestrants, and any lipid-lowering medication (regardless of specific class).

Results: We examined 3754 patients (mean age \pm SD = 54.7 \pm 16.4 years; 47.5% male; mean BMI \pm SD = 29.0 \pm 6.64 kg/m²). After adjusting for age, sex, body mass index, hypertension, diabetes, and history of a stroke, the use of atorvastatin was found to significantly decrease sleep efficiency (β = -1.78; 95% CI = -3.51 to -0.05; p = 0.044). The use of rosuvastatin was found to significantly decrease wake time after sleep onset (β = -6.78; 95% CI = -13.45 to -0.12; p = 0.046). However, the use of other lipid-lowering medications, regardless of specific class, did not significantly impact sleep.

Conclusion: The use of some lipid-lowering medication classes is associated with changes in patient's sleep quality. Clinicians should consider counselling patients on the impact of lipid-lowering medications on their sleep.

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Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

79 La Snooz Toolbox : Une Solution Multiplateforme en Libre Accès Pour L'analyse Des Données De Sommeil.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction

Les outils d'analyse avancée des polysomnographies (PSG) requièrent souvent des compétences en programmation, ne gèrent pas toujours les artefacts ni l'harmonisation des cohortes, et sont rarement multiplateformes. Ce projet visait à développer une application multiplateforme (Windows, macOS et Linux), intuitive, en libre accès, pour harmoniser, traiter et interpréter de grandes quantités de données PSG, y compris le format EDF.

Méthode

Nous avons identifié les besoins par une consultation auprès des chercheurs, technologues et cliniciens du sommeil. Sur cette base, nous avons développé une plateforme facile à utiliser, flexible et extensible, nommée la *Snooz Toolbox*. Nous avons intégré et validé les outils les plus fréquemment utilisés par la communauté. Enfin, des utilisateurs ont expérimenté les outils et l'interface avec des PSG enregistrées auprès de sujets sains, de ceux ayant des troubles du sommeil, ou en état de conscience altérée.

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Résultats

Les outils suivants ont été intégrés à la plateforme : importation et harmonisation des annotations, détecteurs d'événements (artéfacts, fuseaux, ondes lentes), analyse spectrale, segmentation des cycles de sommeil et génération de rapports.

La plateforme présente deux interfaces : 1) une interface guidée, étape par étape, avec des paramètres par défaut, qui ne nécessite aucune compétence en programmation; et 2) une interface pour développeurs offrant l'accès aux blocs de composition des outils ainsi qu'à des paramètres supplémentaires. Des scripts, accompagnés d'une documentation complète et d'exemples, sont fournis aux programmeurs pour faciliter leur développement.

Conclusion

La *Snooz Toolbox*, codée en Python pour exploiter un large éventail de bibliothèques, répond aux besoins des chercheurs, cliniciens, technologues et ingénieurs. Elle offre des interfaces conviviales adaptées à divers niveaux d'expertise, ainsi qu'une documentation détaillée. Sa nature en libre accès favorise la collaboration, proposant un outil flexible et extensible qui favorise le développement et la diffusion de nouvelles méthodes d'analyse du sommeil, ainsi que de toute donnée liée à la conscience altérée.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

85 Sex Differences Explain Changes in Sleep and Circadian Rhythms During Antarctic Expeditions

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

Background: Sleep disturbances are the most common complaint among Antarctic sojourners. Though usually attributed to 24-hour darkness in winter and 24-hour daylight in summer, it is unknown whether sex differences differentially contribute to these complaints. Socio-cultural norms in Antarctica must also be considered, as women are a minority in Antarctic missions, who report a heightened sense of being in a social “spotlight”. This may exacerbate sleep difficulties in this environment.

Objective: This study investigates how sex differences differentially disturb sleep and circadian rhythms among Antarctic sojourners across seasons. We hypothesized that females would exhibit more disturbed sleep and circadian rhythms at both seasons.

Methods: We conducted polysomnography (PSG) recordings on **n=20 participants** (10 males and 10 females), matched by station, age, body mass index (BMI), and education/occupation. Saliva samples before and after the PSG day assessed for melatonin and cortisol secretion. Non-parametric Wilcoxon signed-rank tests compared males and females on sleep variables, melatonin, and cortisol at each season.

Results. Females exhibited less percentage in NREM1 ($p=0.05$), and more percentage in NREM3 ($p=0.02$) than males during summer. During winter, females had delayed sleep onset ($p=0.04$), and earlier REM onset ($p=0.04$) than males. Moreover, cortisol was higher among females compared to males in the summer ($p=0.029$). No sex differences were observed in melatonin.

Conclusion: While previous studies have focused on **light-dark cycles** as primary disruptors of sleep, our findings suggest that **sex differences** play a critical role in sleep disturbances in Antarctica, likely influenced by both biological and social factors. Women experience deeper sleep and higher cortisol secretion in summer, but delayed sleep onset and earlier REM phases in winter. Sex differences in sleep and circadian hormones are thus apparent across seasons and in different social contexts.

Submission Category | Catégorie de soumission

Social and cultural aspects of sleep | Aspects sociaux et culturels du sommeil

91 Mild, Sustained Sleep Restriction Reduces Stability and Amplitude of Circadian-Rest Activity Rhythms and Increases Their Fragmentation in Healthy Adults

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Background: Circadian rest-activity rhythms (CRAR) and sleep behaviors are innately linked and are associated with cardiometabolic health. However, the causal impact of chronic short sleep on CRAR has not been formally evaluated.

Methods: Adults at elevated cardiometabolic risk but without prevalent diseases were recruited to participate in one of two separate outpatient randomized crossover trials with identical interventions. Participants had adequate habitual sleep (≥ 7 h/night), determined from wrist actigraphy during screening. Individuals with a sleep or psychiatric disorder, working non-standard day hours, or using hormonal contraceptive or therapy were excluded. Participants were randomized to restrict their sleep by 1.5h/night (SR) or maintain their habitual sleep duration (HS) for periods of 6wk each, separated by a 2-6wk washout. CRAR were evaluated using continuous wrist accelerometry and analyzed to calculate their mesor (mean value), amplitude (difference between maximum value and mesor), intradaily variability (IV), Raleigh test (RT), and interdaily stability (IS). The IV served as marker of the CRAR fragmentation while RT and IS were of stability.

Results: Data from 72 participants (70.8% females, age 35.2 ± 13.2 y, BMI 25.7 ± 3.5 kg/m²) with average sleep duration of 456 ± 51 min. Over the 6 wk SR phase, sleep averaged 368 ± 46 min compared to 446 ± 53 min during HS. Compared to baseline, SR increased the mesor ($p=0.004$) and IV ($p=0.005$) and reduced the amplitude ($p<0.001$) of the CRAR. HS was not different from baseline (all $p>0.2$). Mesor and IV were lower during HS vs SR ($p<0.001$) while amplitude, RT and IS were higher ($p<0.001$).

Discussion: This study shows that mild SR reduces the amplitude and stability of CRAR, while it increases their fragmentation, which could be associated with elevated risk for cardiometabolic disorders. Future research should aim to determine whether changes in CRAR mediate or moderate the relationship between insufficient sleep and poorer health outcomes.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

119 Prévalence du Syndrome d'Apnée Obstructive du Sommeil et ses complications chez les patients consultant En Centre Spécialisé de l'Obésité en Guadeloupe

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction : L'insulinorésistance est un état favorisé par l'obésité, générateur de complications cardiovasculaires. Le syndrome d'apnée du sommeil, par mécanisme d'hypoxie intermittente et éveils multiples nocturnes induit également un état inflammatoire chronique et une insulinorésistance. Notre étude mesure la prévalence du SAHOS et ses complications chez les personnes adultes en situation d'obésité consultant dans notre Centre Spécialisé de l'Obésité, et compare leur degré d'insulinorésistance propre si SAHOS+ versus SAHOS-.

Méthode : étude observationnelle, monocentrique, rétrospective, sur données issues du soin, menée du 01/06/2021 au 30/06/2023 ; avis favorable CER n°A112_26/06/2023. Analyse descriptive. Significativité $p < 0.05$. Calcul de l'indice de HOMA = Insulinémie à jeun (mU/L) × glycémie à jeun (mmol/L) / 22,5 (indice élevé si HOMA IR $\geq 2,44$) ; Pourcentage de masse grasse évaluée par impédancemètre Z-Metrix. Exclusion des causes d'insulinorésistance secondaires connues autres que l'obésité et le SAHOS.

Résultats : De N=1004 patients, la population d'étude fut réduite à N=228, après ablation des critères d'exclusion et des causes autres, connues, d'insulinorésistance. La prévalence de SAHOS était de 61,48% (28,69% modéré à sévère, tous requérant appareillage). Les patients SAHOS+ étaient plus âgés : $47,89 \pm 13,8$ ans, vs $41,04 \pm 11,23$ ans ($p=0,004$), sans différence sur le sexe, l'IMC : $39,17 \pm 7,91$ kg/m², le tour de taille : $111\text{cm} \pm 16,85$, ni le pourcentage de masse grasse : $44,27\% \pm 11,70$, la consommation d'alcool ou de tabac. Parmi les patients avec antécédent d'accidents vasculaires cérébraux ($n = 8$), 100% appartenaient au groupe SAHOS+, versus 0 chez ceux SAHOS- ($p = 0,023$), avec respectivement, un HOMA = $4,29 \pm 2,88$ vs $3,14 \pm 2,10$, $p = 0,021$.

Conclusion: Dans notre étude, les accidents vasculaires cérébraux des personnes en situation d'obésité étaient tous associés à la présence d'un SAHOS, groupe à insulinorésistance majorée comparativement au groupe sans SAHOS, nous invitant à son dépistage et prise en charge systématique.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

123 Electrooculogram-based Quantification of Sleep Apnea in Younger Population with Cardiovascular Diseases

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Background

Patients with sleep apnea are at a higher risk of developing cardiovascular diseases (CVDs). Our recent work has shown a relationship between features extracted from electrooculography (EOG) and sleep apnea in the young population (age ≤ 50). Therefore, via the association with sleep apnea, EOG signals are expected to capture information that may relate to a younger population developing CVD.

Objective

To explore the potential association of EOG with sleep apnea and examine the association of EOG with the development of CVDs in populations ≤ 50 and ≤ 70 years of age.

Methods

EOG signals from the Sleep Heart Health Study (SHHS) database were analyzed to extract spatial and spectral features. These features were used in machine-learning models to distinguish between individuals who did and did not develop incident CVD after the initial visit. We performed EOG-based sleep apnea analyses with two age groups, ≤ 50 (case A) and ≤ 70 (case B). In case A, the features were obtained from 36 individuals, including 17 who did not develop CVD and 19 who developed CVD. The samples in case A were limited due to the age restriction of SHHS. In case B, both groups had 93 individuals each.

Results

Features were selected using statistics, and the combination of the top 40 EOG features extracted during apneic events yielded the highest accuracy of 75% in differentiating those who developed CVD from those who did not in case A. The specificity and sensitivity were 88.2% and 63.2%, respectively. Increasing the age range to 70 in case B reduced the overall accuracy and yielded no significant result.

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Conclusion

This study established a potential relationship between eye movement characteristics during apneic events and the development of CVD, particularly in a younger demographic. The higher specificity indicates a bias towards individuals who did not subsequently develop CVD; regardless, the results suggest a potential connection.

Submission Category | Cat gorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apn e du sommeil et troubles centraux d'hypersomnolence

128 Are Age-Related Changes in Fluid and Crystallized Intelligence Explained by Sleep Quality?

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | R sum 

A common misconception is that with age, cognition gradually deteriorates across all domains. Instead, only certain aspects of cognition are negatively impacted, while others are relatively unaffected, or continue to improve. For example, Fluid Intelligence (e.g., reasoning, problem solving, employing logic), peaks in early adulthood and steadily declines. By contrast, Crystallized Intelligence (e.g., ability to use and remember facts, events, places) continues to gradually increase with age. It is well-established that sleep supports cognition, and that sleep quality and quantity are reduced with age. Here, we investigated if age-related changes in sleep quantity and quality explain the different trajectories of Fluid and Crystallized Intelligence over the lifespan.

Sixty-one healthy adult participants (N=44 female; age 20-65, M=35.3±18.0 years) underwent a polysomnographic (PSG) screening night to confirm the absence of sleep disorders. Participants were monitored using actigraphy for 10 consecutive days and completed the Cambridge Brain Sciences online test battery to assess Fluid Intelligence and Crystallized Intelligence.

Contrary to the view that Crystallized intellectual abilities continue to improve with increasing age, and that Fluid Intelligence progressively declines with age, multiple linear regression ($R^2 = 0.24$, $F(2,58)=9.17$, $p<0.001$) revealed a negative association between Crystallized Intelligence and age ($sr^2=-0.48$, $t(59)=-4.22$, $p<0.001$), indicating that Crystallized Intelligence may in fact decline over

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the lifespan. Moreover, we found a relatively stable Fluid Intelligence over the adult lifespan ($sr^2 = -0.20$, $t(59) = -1.58$, $p = 0.120$). In addition, age-related changes in total sleep time ($sr^2 = -0.41$, $p = 0.002$) and wake after sleep onset ($sr^2 = -0.50$, $p < 0.001$) significantly accounted for the different trajectories in Crystallized and Fluid Intelligence.

The results suggest that age-related changes in sleep duration and sleep quality may explain cognitive decline for Crystallized Intelligence, and that those who experience better sleep with age may have better preserved Fluid Intelligence.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

131 Comparing Diary and Sensor-Based Sleep Metrics in the Context of Cognitive Behavioral Therapy for Insomnia

Catherine Pagiatakis¹, Zohreh H. Meybodi¹, Francis Thibault¹, Rola Harmouche¹, Jordan Hovdebo¹, Michelle Levasseur¹, Mehdi Es-sounni^{2,3}, Florence D. Pomares^{2,3}, Lylou Guilloton^{2,3}, Samuel Gillman^{2,3,4}, Rebecca Robillard^{5,6}, Sylvie Belleville^{2,7}, Thanh Dang-Vu^{2,3,4,7}, Gino De Luca¹

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Cognitive Behavioural Therapy for insomnia (CBT-I) is an effective treatment, significantly reducing symptom severity for both primary and comorbid insomnia for years following treatment discontinuation. However, access to therapists, time commitment and journaling, as well as symptom monitoring and adherence remain barriers to this treatment. To address these limitations, web-based and mobile technologies are increasingly being used to provide health-related assessments or interventions; previous research has shown that digital versions of CBT-I (dCBT-I) are an adequate alternative to the traditional approach. Sensors could potentially eliminate tedious and manual sleep data collection required by dCBT-I, and offer objective and additional data pertaining to sleep (e.g. sleep fragmentation) which could be used to monitor and personalise the intervention, ultimately impacting adherence and outcome. This work compares sleep metrics collected using sensors to those obtained using the standard sleep journal, in order

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to evaluate their potential to inform a dCBT-I. Twenty older adults (65+) with insomnia and five without insomnia were recruited for the study. For 14 days, sleep data was collected using a journal and various sensors. Total Sleep Time (TST), Wake-After-Sleep Onset (WASO), Sleep Efficiency (SE), and Time-In-Bed (TiB) were compared between the journal and two of the sensors: the Withings Sleep Mat and Fitbit Charge 5, using Pearson's r and Spearman's rank correlations. Statistically significant positive correlations were found between the sensors and journal for TST and TiB ($r_{\text{TST}}=0.33$, $r_{\text{TiB}}=0.24$, $p<0.0001$). A strong, positive, statistically significant correlation was found between the two sensors for TST ($r=0.89$, $p<0.0001$). For WASO, no significant correlation was found between the sensors and the journal, but a positive correlation was found between the two sensors ($r=0.38$, $p<0.0001$). These results suggest that sensors could provide consistent sleep metrics that may be used to inform a dCBT-I. A pilot study is underway comparing intervention outcomes between journal-based and sensor-based dCBT-I.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

136 Clusterin Levels and Efficacy of Cognitive Behavioral Therapy for Insomnia in Older Individuals

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⁴Sunnybrook Research Institute, Toronto, ON, Canada. ⁵University of Ottawa, Ottawa, ON, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Background

Insomnia has recently been identified as a risk factor for Alzheimer's disease (AD). However, there probably exists a bidirectional relationship between AD and insomnia, where AD-related processes could produce insomnia symptoms. In that context, when early neurodegenerative processes might contribute to insomnia symptoms, behavioral treatments for insomnia, such as cognitive-behavioral therapy for insomnia (CBT-I), could be less efficient in alleviating symptoms. The aim of this project was to investigate if higher baseline plasma clusterin levels, a biomarker of early AD-

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related pathological processes, reduces the subsequent efficacy of CBT-I in improving insomnia symptoms.

Methods

Twelve participants (9W, age:62.2±5.1 [range:53-68]) with diagnosed chronic primary insomnia without dementia were assessed before and after six weeks of CBT-I with the Insomnia Severity Index (ISI). Plasma clusterin levels were measured using ELISA from blood samples collected before/at the beginning of CBT-I. Participants also completed the Beck Depression and Anxiety Inventories (BDI/BAI-II) before CBT-I. Regression analyses (linear and hierarchical) were used to assess associations between clusterin levels and changes in ISI post-CBT-I or baseline depression and anxiety levels.

Results

Baseline clusterin levels were not associated with improvements in ISI scores ($\beta=-0.444$, $t(10)=-1.567$, $p=0.148$) without adjustments. When adjusting for age, sex, BDI and BAI-II scores, a trend showed that higher baseline clusterin was marginally associated with less improvement in ISI scores (hierarchical regression $\beta=-0.686$, $t(5)=-2.450$, $p=0.058$). Furthermore, clusterin levels were not associated with anxiety ($\beta=-0.254$, $t(9)=-0.786$, $p=0.452$) and depression ($\beta=0.015$, $t(9)=0.044$, $p=0.966$) levels pre-CBT-I.

Conclusion

Clusterin-related subclinical pathological processes may not reduce the efficacy of CBT-I, but, considering that this research is a preliminary study, we need further investigation in a larger sample to fully comprehend the extend of the relation between the clusterin and the efficacy of CBT-I.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

138 Real-World Implementation of the 2024 Canadian Recommendations for the Management of Chronic Insomnia.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

The recently published 2024 Canadian recommendations for managing chronic insomnia emphasize the need to increase awareness, capacity for, and access to CBT-I; and to integrate newly approved pharmacotherapies into treatment plans. They also underscore the need to reduce both self-medication and the use of medications with limited supporting evidence or with safety concerns that outweigh their benefits. While applying these recommendations will offer more effective and evidence-based care for patients, practical aspects remain to be clarified for these recommendations to be fully adopted and affect change in practice. Here we focus on how to apply the key recommendations for managing chronic insomnia:

- Chronic insomnia should be specifically targeted for treatment, even in the presence of comorbidities.
- Cognitive-behavioural therapy for insomnia (CBT-I) is the first-line treatment. Sleep hygiene alone is not CBT-I.
- Benzodiazepines and z-drugs are effective for short-term management, despite concerns about adverse effects and tolerance. Some evidence demonstrated a relative lack of tolerance of the z-drug eszopiclone.
- Dual orexin antagonists (DORA) may have benefits that outweigh their risks for long-term use (e.g., no tolerance in 12-month studies and absence of rebound or abuse potential in controlled clinical trials).
- Outside of certain subpopulations, there is lack of evidence on the use of melatonin, the long-term effect of cannabinoids; and the benefits of off-label medications (e.g., antidepressants and antipsychotics for the treatment of chronic insomnia. Purity of melatonin and safety of cannabinoids, antidepressants and antipsychotics are also concerns.

However, implementing the new recommendations for managing chronic insomnia in real-world settings, particularly those related to novel therapies, will require a granular understanding of the evidence distinguishing the different classes of medication and identifying the most suitable treatment within each class. This underscores the need to educate on the impact of insomnia in Canada and how to leverage evidence to improve the care of our patients.

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Submission Category | Catégorie de soumission

Insomnia | Insomnie

144 Development of the Fundamentals of Healthy Sleep for the Canadian Armed Forces

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction: The Canadian Armed Forces (CAF) and NATO members now recognize sleep as an important human factor for overall health and military readiness. In Canada and across NATO, short sleep and poor sleep quality remain highly prevalent. In Canada more than half (58%) of Regular Force members report not achieving the recommended 7 hours of sleep per night, which is almost double the estimates from the general population (~30%). Our goal was to develop for the first time a specific evidence-based sleep health training to be delivered within the network of Health Promotion professionals of the CAF.

Methods: An interdisciplinary working group of specialized health promotion professionals of the Personnel Support Programs (PSP) of CAF partnered with a scientific team from the University of Montreal (UdeM). The “Fundamentals of Healthy Sleep” Training Module was developed in 5 stages: (1) knowledge needs expressed by PSP; (2) development of raw material by UdeM; (3) curation of material (PSP-UdeM); (4) development of the semi-final product and French translation (PSP-UdeM); and (5) Training workshops (PSP-UdeM).

Results: Stage 1, PSP identified 8 learning objectives as critical for CAF. Stage 2, a comprehensive list of resources and material was created by UdeM. Stage 3, several meetings between the PSP-UdeM led to the curation of the 45 min training module and trainer’s resources. Stage 4, the semi-final product was developed following strict communication guidelines. Stage 5, a total of 67 PSP

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Health Promotion professionals attended at least 1 of two virtual training workshops and/or were provided with access to the asynchronous virtual recording.

Conclusions: Our study highlights the collaborative process to develop a sleep product in direct response to CAF's needs. Our study is a success story of intersectoral collaboration between academia and the Armed Forces. Our training has an estimated target audience of 100,000 Defence personnel.

Submission Category | Catégorie de soumission

Sleep and occupational health and safety | Sommeil et la santé et sécurité au travail

158 Navigating Sleep Disturbances in the Acute and Chronic Phases of Mild Traumatic Brain Injury: Impact of Family Functioning on Sleep and Intervention Outcomes

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Background: Sleep disturbances are common in the acute (0-4 weeks) and chronic (≥ 3 months) phases of mild traumatic brain injury (mTBI). In the general population, sleep and family functioning influence each other, but the link between the way a family operates and sleep disturbances after mTBI remains unclear. **Aims:** 1) Investigate the relationship between sleep and family functioning in the acute and chronic phases of mTBI; 2) Explore whether family functioning influences sleep intervention outcomes. **Methods:** In total, 56 mTBI patients (≥ 18 years) and 56 family members participated in this cohort study. TBI patients wore a wrist actigraph for 7 consecutive days/nights to track their 24-h activity-rest cycles at 0-4 weeks and 3 months post-injury. At both phases, they completed the Pittsburgh Sleep Quality Index (PSQI) and, together with their family member, the Family Assessment Device (FAD) combining a General Functioning scale and six subscales (Problem Solving, Communication, Roles, Affective Responsiveness, Affective Involvement, Behavior Control). Patients with a PSQI score ≥ 5 at 3 months were offered a 90-minute sleep hygiene education session leading to a personalized plan, followed by a two-week trial at home. Measures were repeated post-intervention. **Results:** 45% of mTBI adults in the acute phase and 53.5% in the chronic phase slept less than 7-h/24-h. Impairments in sleep quality (PSQI ≥ 5) were observed in more than 75% of participants at both phases. A significant interaction between recovery phase, sleep quality, and family communication was found [$F(1, 45.72)=4.08$, $p=0.049$]. Among mTBI patients who completed the intervention at 3 months ($n=16$), 50% showed a

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≥20% PSQI score improvement. The family behavior control subscale distinguishes intervention responders from non-responders ($p < 0.01$). **Conclusions:** This is the first study to showcase a potential link between family functioning, sleep quality, and responsiveness to sleep hygiene interventions, opening doors to new research avenues.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

161 Inactivation of Cofilin and Sleep Regulation: Analysis of Electrocorticographic Signals in Male and Female Mice

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Sleep is essential for cerebral homeostasis and neuronal plasticity. A lack of sleep impairs plasticity and, in parallel, increases the intensity of subsequent sleep, as marked by an increase in slow wave activity on the electrocorticogram (ECoG). Cofilin, a protein involved in structural plasticity, was shown to be altered by sleep deprivation, but its role in shaping ECoG activity during wake/sleep states remains to be explored. The aim of this study is to determine the involvement of cofilin in the regulation of ECoG activity in mice under both baseline and sleep deprivation, and to determine whether an effect depends on sex. The hypothesis is that cofilin inactivation will modify the quality of the ECoG during normal sleep and recovery sleep. To test this, adult male and female C57BL/6J mice were injected with an adeno-associated virus expressing an inactive cofilin (mutation of serine 3 to aspartic acid: AAV9-CaMKII α -cofilinS3D-HA) or a control AAV (AAV9-CaMKII α -eGFP) in the motor and visual cortex. ECoG electrodes were implanted during the same procedure. Three weeks later, the ECoG signal was recorded for 48 hours without intervention, then during 6 hours of sleep deprivation, and finally 42 hours of recovery. Sleep stages are currently identified, and ECoG activity will be extracted by spectral and multifractal analyses and compared between groups and sexes. Viral infection and synaptic integrity will be verified by immunohistochemistry. Preliminary findings show an increased ECoG activity in the beta range

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during wakefulness and delta range during paradoxical sleep. This project will define the impact of cofilin inactivation on sleep quality under normal conditions and during recovery from sleep loss.

Keywords: Cofilin, Electrocorticography, Slow-Wave Sleep, REM sleep, Wakefulness, Synaptic plasticity.

Submission Category | Cat gorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

163 Characterization of Physical Activity, and Functional and Exercise Capacity in Obstructive Sleep Apnea

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | R sum 

Obstructive sleep apnea (OSA) is associated with sedentary behaviours, but physical activity (PA) can improve health and sleep apnea severity. Whether daily patterns of PA relate to standardized measures of functional capacity (6-Minute Walk Test, 6MWT) or exercise capacity (cardiopulmonary exercise testing, CPET) in OSA is unknown. The objective of this study is to characterize daily PA, functional capacity, and exercise capacity in therapy-naive individuals with polysomnography-diagnosed OSA (AHI>5).

Twelve participants with OSA (age 51.2 9.3 yrs, 50% males, AHI 33.9 30.3) completed measurement of sleep quality (Pittsburgh Sleep Quality Index [PSQI]), seven days of PA tracking (ActivPal actigraph), 6MWT and CPET prior to the initiation of continuous positive airway pressure (CPAP) therapy. Patients reported poor sleep quality (PSQI global score 9.5 5.1) and spent 7.8 1.5hours in bed. Average daily step count was 8173.3 3827.5, while average daily sedentary time was 10.1 1.8hours. 6MWT distance (6MWD) was 539.4 108.6m (88 12% predicted), with a BORG dyspnea rating at end of 6MWT of 1.8 1.1. During CPET, average total exercise time was

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14.6±5.9min, with peak work rate 150±54.3 W, VO₂peak 22.7±8.2 ml/kg/min, peak VE 73±17.8 L/min, peak heart rate 145.6±22.7 bpm, peak VCO₂ 2.3±0.7 L/min, peak VE/VCO₂ 31.5±4.2, BORG dyspnea at peak 4.9±2.4, BORG leg discomfort at peak 5.2±1.9. There was a significant positive correlation between 6MWD and VO₂peak, $r(10)=.77$, $p=.003$, and 6MWD and peak work rate, $r(10)=.75$, $p=.005$.

Preliminary analyses suggest a relationship between functional and exercise capacities in OSA. Recruitment is ongoing to expand investigation to include associations with PA and self-reported symptoms. Detailed assessment of PA, functional capacity, and exercise capacity in OSA patients prior to CPAP therapy provides an important baseline for interrogation of treatment effects.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

169 Better Characterization of Sleep with Odds Ratio Product in a Patient with Severe COMISA Undergoing Opioid Withdrawal Therapy

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction: Odds ratio product (ORP) is a validated measure of sleep depth on a scale from 0 to 2.5. Using 3-second epochs, it provides a fine-grained analysis of a patient's sleep, beyond the conventional sleep architecture. The following case study highlights the utility of ORP.

Methods: The current case study describes a diagnostic polysomnogram, collected with the Cerebra Sleep System, of a 48-year-old male. Patient complained of sleep less than 2 hours and waking out of breath. Patient was on several medications, including suboxone for withdrawal from opioid pain medications, delatestryl, paxil, propranolol, and Synthroid. Patient completed the Insomnia Severity Index, and Depression-Anxiety-Stress Scale (DASS). ORP was measured during wake, NREM, and REM sleep, and the percentage of total recording time spent at each decile of the ORP from 0-2.5 was computed. Additionally, conventional architecture was scored by an RPSGT.

Results: Patient presented with extremely severe depression scores (DASS-D=40/42), and severe insomnia (ISI= 26). Based on conventional sleep architecture, the patient had 5 hours and 52 minutes TST and sleep efficiency of 70.9%, 77.6% in N2, 22% in N1, 0.4% in N3 and 0% in REM. The

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patient had severe OSA (RDI of 52.2 /hr). ORP_{wake} (2.2) was very similar to ORP_{NREM} (2.1), illustrating very shallow sleep. The patient had no time spent in very deep or deep sleep, with an excessive amount of time spent over 2.0 of ORP (68.5%), which is more characteristic of high frequency in wakefulness.

Conclusion: Conventional architecture shows poor sleep quality, but 6 hours of sleep. With ORP, there is consistency with the patient complaint of less than 2 hours of sleep, as the patient could perceive the extremely shallow sleep as wakefulness. ORP provides evidence of sleep disruption beyond the effects of OSA, not detectable from the conventional architecture, and possibly related to the use of suboxone.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

178 The Effect of Videoconference-Delivered Cognitive Behavioral Therapy for Insomnia (CBTi) on Burnout Symptoms in Working Adults

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction

Insomnia is increasingly recognized as both a contributing factor to burnout and a predictor of future disability leave. Despite this, little research has investigated whether treating insomnia can alleviate burnout symptoms. This study aimed to examine the impact of videoconference-delivered Cognitive Behavioral Therapy for Insomnia (CBTi) on burnout symptoms in a working adult population.

Methods

Thirty adult workers (mean age = 42.6) experiencing insomnia participated in HALEO's CBTi program, which consisted of five weekly, 30-minute video sessions with licensed therapists, supported by a digital platform. Insomnia severity was assessed using the Insomnia Severity Index (ISI), and burnout symptoms were measured with the Burnout Assessment Tool (BAT; version 2.0). Participants completed both measures at baseline and three months post-therapy. Data were

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analyzed using one-tailed paired t-tests to assess changes in ISI and BAT scores, and Pearson correlations to examine associations between changes in insomnia and burnout symptoms.

Results

ISI scores significantly decreased from baseline ($M = 15.93$, $SD = 4.36$) to post-therapy ($M = 7.30$, $SD = 5.72$; $t(29) = 7.68$, $p < .001$, $d = 1.40$). Similarly, BAT scores were significantly lower post-therapy ($M = 2.03$, $SD = 0.54$) compared to baseline ($M = 2.54$, $SD = 0.48$; $t(29) = 5.57$, $p < .001$, $d = 1.02$). A significant positive correlation was found between improvements in ISI and BAT scores ($r = 0.519$, $p = .003$), indicating that reductions in insomnia severity were associated with reductions in burnout symptoms.

Conclusions

The findings suggest that, beyond its established effectiveness in reducing insomnia symptoms, videoconference-delivered CBTi may also contribute to significant reductions in burnout symptoms among working adults. The observed correlation between reductions in insomnia and burnout symptoms highlights a potential interaction that warrants further exploration.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

182 Associations Between Sleep Misperception and Anxiety Symptoms in Older Adults with Insomnia: Preliminary Findings

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Background: Chronic insomnia is the most common sleep disorder among older adults. There have been several reports of sleep misperception, but little is known about how this presents in geriatric

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insomnia. This study examines the gap between subjective and objective sleep in older adults with chronic insomnia compared to good sleepers, while assessing the potential link between anxiety and sleep misperception.

Methods: Forty nights of sleep were monitored in two groups of participants aged 60 and over: good sleepers (8 nights) and insomnia disorder based on DSM-V-TR criteria (32 nights). The consensus sleep diary was used to document subjective sleep estimates. Objective sleep was measured using the Muse-S EEG headband. Anxiety levels were assessed with the Geriatric Anxiety Inventory (GAI).

Results: The range of subjective-objective discrepancy across sleep metrics was 4 to 18 times larger in those with insomnia compared to good sleepers. In the insomnia group, this included under- and over-estimation relative to objective measures ranging from -213 to +210minutes for total sleep time (TST; IQR:146), -72 to +172minutes for sleep onset latency (SOL; IQR:15), and -149 to +154minutes for wake after sleep onset (WASO; IQR:81). Correlations between subjective and objective sleep metrics were much weaker for the insomnia group [TST ($r=.35$, $p=.049$), SOL ($r=.23$, $p=.209$), WASO ($r=.26$, $p=.153$)] than for good sleepers [TST ($r=.91$, $p<.001$), SOL ($r=.81$, $p=.014$), WASO ($r=.79$, $p=.020$)]. Across both groups, there was a moderate positive correlation between GAI scores and the discrepancy between subjective and objective TST ($r(40)=.55$, $p<.001$).

Conclusions: These preliminary findings suggest that older individuals with insomnia are more prone to sleep misperception than good sleepers. Furthermore, worse sleep misperception was found to be associated with higher anxiety levels. This reinforces the need to consider sleep misperception and anxiety levels to guide clinical monitoring strategies and intervention for geriatric insomnia.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

184 Making an Effective Direct-to-Patient Mailed Intervention to Align Insomnia Care With Practice Guidelines

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction: Standard management of insomnia in primary care centres on prescribed sedatives. Whereas there is consensus among insomnia guidelines that cognitive-behavioural therapy for insomnia (CBT-I) be used first-line. Transitioning the standard of care from sedatives to CBT-I presents several patient, provider, and systems obstacles. This includes challenges with deprescribing sedatives and introducing accessible versions of CBT-I. In this presentation, we describe the development of a direct-to-patient intervention that reduced sedative use and increased CBT-I uptake.

Methods: The YAWNS NB randomized trial mailed Sleepwell packages directly to study participants. Each package included a cover letter and 2 booklets (How to Stop Sleeping Pills and How to Get Your Sleep Back). The contents were derived from mysleepwell.ca, a knowledge mobilization public resource, and shaped by behaviour change intervention development resources including the Behaviour Change Wheel and the Behaviour Change Techniques (BCTs) taxonomy. An examination of the embedded behaviour change techniques was conducted.

Results: YAWNS NB allocated 580 participants averaging 72 years of age and 11 years of sedative use to 3 groups. 170 Sleepwell participants completed the trial. As a direct-to-patient intervention, the Sleepwell package was associated with reduced sedative use (26% stopped and 20% reduced their daily dose $\geq 25\%$), increased use of CBT-I, improved sleep measures, and reduced daytime sleepiness compared to control groups. The cover letter included 3 BCTs from 3 BCT groups. Booklet 1 included 23 BCTs from 9 groups and Booklet 2 included 19 BCTs from 11 groups. Collectively, the Sleepwell intervention embedded 29 BCTs from 12 groups, with 13 BCTs and 7 groups common to both booklets.

Conclusion: The development of direct-to-patient interventions using behaviour change intervention tools represents an effective, novel, and potentially scalable approach to transitioning the standard of care of insomnia in primary care.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

186 A Systematic Review of the Literature on the Association between Sleep Health and Bulimia Nervosa: Preliminary Findings

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction

Sleep disturbances are often observed in individuals with eating disorders, yet specific research on sleep and bulimia nervosa (BN) remains limited and inconsistent. Some studies suggest that individuals with BN experience poorer sleep quality and more sleep disturbances than healthy controls, while others find no significant differences. We are not aware of any systematic review documenting the association between sleep health and BN, which could highlight unique behavioural and physiological mechanisms underlying BN. Understanding these links may guide interventions targeting both sleep and eating disruptions as interconnected issues.

Objectives:

To review, synthesize, and evaluate the literature on the association between sleep health and BN in adolescents and adults, and to identify areas for future research.

Methods:

Searches were conducted in PsycINFO, Medline, ProQuest Dissertations and Theses Global, Clinical Trials, and Web of Science Core Collection databases. Inclusion criteria included original quantitative studies in English or French, documenting at least a bivariate association between sleep and BN in adolescents or adults. Data extracted included study aims, design, sample characteristics, key results, confounding variables, and effect sizes.

Results:

A total of 3626 titles and abstracts and 196 full articles were screened. The final sample included 14 studies. Over half (57%) reported sleep disturbances in individuals with BN, including lower sleep efficiency and poorer sleep quality, compared to healthy controls. These findings were predominantly based on subjective sleep assessments rather than objective measures like polysomnography.

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Conclusions:

Overall, individuals with BN report more frequent sleep disturbances than those without psychiatric conditions. Further research is needed to clarify the psychological and biological factors driving this association, which may inform integrated treatment approaches for sleep health and BN.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

196 Directed Breathing During Sleep in Healthy Adults

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Respiration is easily controlled and manipulated during wakefulness, yet we lose this ease of respiratory control during sleep. Previous studies have found that when sounds associated with specific memories are reintroduced during sleep, those specific memories are reactivated. Here, we sought to determine the extent to which a learned respiratory response can be reactivated and performed during sleep. We tested this question in 10 young, healthy participants who trained to synchronize their breathing to an auditory stimulus during wake over multiple days. Subsequently, the stimulus was reintroduced during sleep. The degree of synchronization of breathing to the sound and changes in respiration were measured. Our quantitative strategy identified multiple trials of apparently successful synchrony, but due to their rarity we cannot rule out that these reflect chance occurrences rather than genuine respiratory responses. Across all trials, we failed to observe systematic changes in respiratory measures in response to cues during sleep. However, our study question opens the door to investigate cases of decreased respiratory control during sleep, such as in sleep apnea.

Submission Category | Catégorie de soumission

Sleep, brain plasticity and memory | Sommeil, plasticité cérébrale et mémoire

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

198 Parental Separation in Early Childhood and Sleep Problems in Preschool Period: The Differential Role of Socioeconomic Status

Ms. Anita Kiafar^{1,2}, Dr. Victoria Talwar¹, Ms. Christine Laganière^{1,2}, Ms. Malka Hershon^{1,2}, Ms. Michelle Ly^{1,2}, Dr. Hélène Gaudreau², Dr. Marie-Hélène Pennestri^{1,2}

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction: Sleep is essential for optimal child development and is influenced by family context and socioeconomic status (SES). Parental separation often involves changes in routine and environment, including sleep routines. It is therefore surprising that the association between parental separation in early childhood and sleep problems in preschoolers is understudied.

Aim: This study sought to examine the association between parental separation in early childhood and family SES with children's sleep problems at 5 years old, while controlling for maternal depressive symptoms and child sex. **Methods:** The sample included 245 mother-child dyads from the the Maternal Adversity, Vulnerability and Neurodevelopment (MAVAN) cohort. Mothers were asked at 6, 12-, 18-, 24- and 36-months age if they had separated from their partners since their child was born. Family SES was derived using a combination of maternal education level and family income. The sleep subscale of the Child Behaviour Checklist (CBCL) and the Child Sleep Habits Questionnaire (CSHQ) were used to assess sleep problems in children at age 5. Maternal depressive symptoms at 5 years (CES-D) and child's sex were included as covariates. **Results:** A two-way ANCOVA showed a significant interaction effect between parental separation status and family SES on children's sleep problems at 5 years (CBCL: $p = 0.007$; CSHQ: $p = 0.002$). In the low SES group, children with separated parents had higher scores for sleep problems ($M \pm SD$: CBCL = 4.92 ± 0.73 ; CSHQ = 51.37 ± 2.11) than children with non-separated parents (CBCL: 2.26 ± 0.49 , $p = 0.002$; CSHQ: 43.24 ± 1.42 , $p = 0.001$), while there was no significant difference in the high SES group between groups ($p > 0.05$). **Conclusion:** Parental separation in early childhood was associated with more sleep problems at age 5, but only for children from low SES backgrounds. The results suggest a differential role of SES in the relationship between parental separation and children's sleep problems.

Submission Category | Catégorie de soumission

Sleep equity | Équité face au sommeil

201 Non-Rapid Eye Movement Sleep Parasomnias and Mental Health in Childhood: Systematic Review of the Literature

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction

Sleep problems in childhood are under-recognized by parents and physicians and tend to persist over the long term. One common type of sleep problems in childhood is non-rapid eye movement sleep (NREM) parasomnias, such as sleep terrors, sleepwalking, and confusional arousals. Several studies show associations between NREM-parasomnias and mental health in children and adolescents, but this topic has not been systematically reviewed. The present review aimed to appraise the current state of knowledge on the association between NREM-parasomnias and mental health in childhood.

Methods

A systematic search was conducted in PsychINFO and Medline, and 377 unique references were found. Articles were screened based on the following inclusion criteria: original study, assessment of at least one NREM-parasomnia between ages 0 and 18 years, assessment of at least one mental health variable (i.e., diagnosis, symptoms, inventory, questionnaire or scale score), report of an association between mental health and NREM-parasomnia(s), articles written in English or French. After screening, 47 full-text articles remained and were reviewed.

Results

Most studies (n=40) were conducted on school-aged children (5-12 years). Only 14 studies included children under 5, and 18 studies included teenagers (13-19 years old). Few studies were conducted on longitudinal cohorts (n=8). Among the 47 studies, 40 found an association between NREM-parasomnias and at least one mental health variable. A wide range of mental health problems and symptoms were associated with NREM-parasomnias: internalizing problems, externalizing problems, psychotic experiences, and inattention-hyperactivity problems. Most studies used scales to assess NREM-parasomnias (n=30), but this method rarely reflected exactly the current diagnostic categories and included other sleep problems.

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Conclusions

Future studies should focus on longitudinal data, using current diagnostic categories, and two critical periods of emotional development: toddlerhood and adolescence. Clinicians may want to be attentive to potential mental health symptoms in children experiencing NREM-parasomnias.

Submission Category | Catégorie de soumission

Parasomnias | Parasomnies

209 Efficacy and safety of glucagon-like peptide 1 receptor agonists for treatment of obstructive sleep apnea: a systematic review and meta-analysis of randomized controlled trials

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Objective: To assess and synthesize the efficacy and safety of glucagon-like peptide-1 receptor agonists (GLP-1RA) in obstructive sleep apnea (OSA).

Method: This PRISMA 2020-compliant systematic review and meta-analysis (CRD42024537280) searched MEDLINE, EMBASE, Cochrane and PsychINFO for randomized controlled trials (RCTs) of GLP-1RA for the treatment of OSA. Meta-analysis was performed with a random effects model to assess changes in OSA (apnea-hypopnea index [AHI]) compared to CPAP or placebo. Standardized mean difference (SMD) and Risk Ratio (RR) were computed (continuous/binary outcomes). Heterogeneity assessment, risk of bias with ROB2, leave-one-out, and subgroup analysis were completed.

Results: Five studies were included (N=1,023; 511 GLP-1RA and 512 control). Four studies used liraglutide and one study used tirzepatide. Participants with GLP-1RA treatment had a significant reduction in AHI when compared to placebo (SMD=-0.69; 95%CI=-1.10 to -0.26; p=0.001; I²=88.0%). No significant difference was found when compared to continuous positive airway pressure (CPAP). No evidence of publication bias was found. Leave-one-out analysis confirmed robustness in effect size. No significant differences were found between subgroups (risk of bias and industry sponsorship). There was no significant difference in serious adverse events compared to control (RR=0.886; 95%CI=0.500 to 1.570; p=0.679; I²=20.93%). Three studies had high risk of bias and two were low.

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Conclusion: GLP-1RAs may have therapeutic potential in the treatment of OSA. Current studies are limited by small sample size, lack of blinding, and short duration.

Funding: None

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

210 Longitudinal Effects of Health Status on Sleep Duration: Insights from the NLSY97 Cohort

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Sleep disturbances are often linked to poor health, with individuals suffering from health conditions frequently experiencing reduced sleep duration. However, much of the existing literature relies on cross-sectional or short-term data, leaving a gap in understanding the long-term effects of health status on sleep. This study examines the longitudinal relationship between health status and sleep duration using data from the National Longitudinal Survey of Youth – 1997 Cohort (NLSY97). The cohort, aged 12–17 in 1997, was 22–31 years old during the 2007–2009 data collection rounds. The present study explored (1) how time influences sleep duration over three years, (2) whether health severity predicts sleep duration, and (3) whether average health status (health severity across three years) predicts sleep duration beyond the effects of time and health severity. A two-level multilevel modelling approach was used, with time and health severity as level-1 predictors and average health status as a level-2 predictor. Results showed significant declines in sleep duration over time and a negative association between both health severity and average health status with sleep duration. Average health status significantly predicted lower sleep duration beyond the effects of health severity and time. These findings highlight the cumulative impact of health on sleep, suggesting that public health interventions should consider both immediate and long-term effects on sleep health.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

211 Self and Other Agency in (Lucid) Dreaming: Neurocognitive Correlates and Phenomenological Inquiry of Dream Guides

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Lucid dreaming is broadly recognized as the phenomenon of becoming aware that one is dreaming while actively dreaming. While non-lucid dreams involve an element of sociality through interactions with other dream characters, lucid dreams present unique opportunities to engage with dream characters in ways meaningful to the dreamer. 'Dream guides' are dream characters that are perceived as particularly important or spiritual and may appear to exercise their own agency outside of the dreamer.

This study investigates whether lucid dreamers can voluntarily elicit meaningful interactions with dream characters, and explores the perceived agency of these characters, including control, emotions, spirituality, and knowledge. In this way, we aim to examine the cognitive processes underlying the sense of agency in dream characters, along with mystical and spiritual aspects of a dream.

Expert lucid dreamers participated in four overnight laboratory sessions and two weeks of at-home dream reporting. In the lab, participants were awakened after several REM cycles and interviewed about their dreams. Once lucid, participants were instructed to perform a left-right-left-right (LRLR) to communicate lucidity with researchers. Sleep stages and signal-verified lucid dreams were measured through polysomnography (EEG/EOG/EMG). At home, participants set intentions for lucidity, recorded their dreams, and completed daily questionnaires on lucidity and mystical experiences.

Preliminary results suggest that lucid dreamers can intentionally provoke meaningful encounters with dream guides in both lab and home settings. Dream guides in lucid dreams displayed more agency (control and spirituality) than non-lucid characters. While participants reported similar connection and attitude towards different dream characters, interactions with dream guides were perceived as more mystical, positive, and meaningful.

These findings indicate that dream guides can be intentionally elicited during lucid dreaming, with dreamers perceiving them as having greater agency and spirituality. Future research will explore how personal beliefs influence these experiences and impacts on mental health.

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Submission Category | Catégorie de soumission

Sleep, dreams and mental health | Sommeil, rêves et santé mentale

212 SLEEP-HOPE: Evaluating Sleep Quality and Quantity in Menopausal Patients with Hypothyroidism Using Hormonal, Pharmacological, and Complementary Therapies in Canada.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction

Sleep disturbances are common in menopausal and hypothyroid patients, significantly impairing quality of life. While hormonal replacement therapies, pharmacological interventions, and complementary and alternative medicine (CAM) approaches are available, their comparative effectiveness in improving sleep quality in real-world Canadian settings remains underexplored. This study aims to evaluate improvements in subjective sleep quality, measured by the Sleep Quality Scale (SQS), in menopausal and hypothyroid patients undergoing various therapeutic interventions. Secondary outcomes include changes in quality-of-life metrics assessed using the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), Thyroid-Specific Patient-Reported Outcome Measure (ThyPRO), and Short Form-8 Health Survey (SF-8).

Materials and Methods

The SLEEP-HOPE study is an observational, longitudinal study conducted across three private endocrinology practices in Montreal, Canada. Female patients with menopause and hypothyroidism reporting unsatisfactory sleep were recruited. Participants completed standardized questionnaires, including PSQI, ESS, ThyPRO, and SF-8, at baseline and three-month follow-ups. Treatment modalities included hormonal therapies (e.g., thyroid hormone replacement, menopausal hormone therapy), pharmacological interventions (e.g., hypnotics, antidepressants), and CAM therapies (e.g., melatonin, ashwagandha, yoga). Additional data on comorbidities, medication adherence, and lifestyle factors were collected.

Statistical Analysis

Descriptive statistics will summarize participant characteristics and treatment distributions. Paired t-tests and ANOVA will compare pre- and post-intervention scores, while multivariate regression analyses will explore associations between treatments and outcomes, adjusting for confounders such as age and BMI.

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Conclusion

This study aims to provide valuable insights into the effectiveness of hormonal, pharmacological, and CAM therapies in addressing sleep disturbances among menopausal patients with hypothyroidism. Findings are expected to show moderate benefits of hormonal therapies while emphasizing the unmet need for optimizing sleep quality. These results will support the development of evidence-based, holistic management strategies to improve sleep and overall quality of life in this patient population.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

217 Perspectives and experiences of teaching sleep education within Australian primary schools: A qualitative study.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction: It is important for children to establish good sleep habits at an early age, as healthy habits track across the lifespan. Despite this, primary school-aged children are not formally taught about sleep within the Australian school curriculum. The objective of this study was to explore teacher perspectives on how the topic of sleep is currently taught and to understand how best to deliver sleep education within the context of Australian primary schools.

Methods: A total of 74 Australian primary school teachers (98.6% female) completed an online qualitative cross-sectional survey. Teachers had an average age of 36.2 years (SD = 10.9 years) and had been teaching for an average of 11.45 years (SD = 10.5 years). A reflexive thematic analysis approach was utilized.

Results: Approximately half (51.4%) of teachers had previously taught sleep education, with a time commitment of typically one 30-minute lesson per term, or 5 to 15 minutes within a lesson teaching content around physical or mental health and wellbeing. Five themes were identified: (1) motivations for teaching sleep education, (2) important messages to learn about sleep during primary school, (3) perceived barriers for teaching sleep education, (4) recommendations for incorporating sleep education within the Australian primary school context and (5) approaches that support primary school teachers to inform and educate parents about children's sleep.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Conclusion: Teachers witness the impact of inadequate sleep in a classroom setting and understand the importance of sleep. By exploring teachers' experiences, we gained valuable insights of current sleep education efforts and how best to implement sleep education within the Australian primary school context. Effective implementation of sleep education requires the integration within curriculum, training, and resources for teachers to deliver content, and the support of the broader school environment including parents.

Submission Category | Cat  gorie de soumission

Sleep health | Sant   du sommeil

220 Association between nocturnal hypoxemia and Kidney injury molecule 1 (KIM-1) in patients with obstructive sleep apnea (OSA)

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | R  sum  

Background: Up to 40% of patients with chronic kidney disease (CKD) have obstructive sleep apnea (OSA) which is associated with greater risk of CKD progression, modulated by nocturnal hypoxemia. CKD diagnosis is based on the estimated glomerular filtration rate (eGFR) and urine albumin:creatinine ratio (ACR), but these are poor markers of early kidney injury. Kidney Injury Molecule 1 (KIM-1), a tubular protein expressed in the renal proximal tubule following ischemic injury, can be measured in urine to reflect kidney injury before eGFR and ACR become abnormal. We hypothesized that KIM-1 is elevated in patients with OSA who have normal eGFR and ACR, and higher KIM-1 is associated with greater nocturnal hypoxemia.

Methods: 976 adults completed diagnostic sleep apnea testing and measurement of eGFR, ACR and KIM-1. OSA and nocturnal hypoxemia were determined from the oxygen desaturation index (ODI, 4%), mean oxygen saturation (SpO₂), and the duration of SpO₂<90% (T90). KIM-1 concentrations were compared between those with no/mild (ODI<15), moderate (15  ODI<30) and severe OSA (ODI  30) and associations between KIM-1 and ODI, mean SpO₂, and T90 were assessed.

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Results: Participants with severe OSA (n=284; 53±12y; 30.3% female) had higher KIM-1 than both the no/mild (n=469; 52±13y; 49% female; p=0.049) and moderate (n=223; 54±11y; 32% female; p=0.031) OSA groups. KIM-1 tended to be positively associated with ODI (β , 95% CI=0.06, -0.007-0.13; p=0.077) and negatively associated with mean SpO₂ (β =-0.07, -0.14- -0.005; p=0.068), but was not associated with T90 (β =0.05, -0.03-0.12; p=0.221). However, these associations were moderated by BMI and became statistically significant at BMIs above 38 kg/m².

Conclusion: Results indicate OSA-related nocturnal hypoxemia may cause kidney injury before a change in eGFR and ACR. Earlier detection of kidney injury provides the opportunity to identify OSA patients at risk of CKD and to include OSA treatment in their renal protection strategy.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

221 Machine-learning Derived Relationships between Sleep Variables and Mortality in ADVENT-HF Trial Patients with Heart Failure and Cheyne-Stokes Respiration

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Background: In heart failure (HF) patients, Cheyne-Stokes respiration (CSR) cycle length (CL) and lung-to-finger-circulation-time (LFCT) are inversely related to cardiac output. We therefore hypothesized, in patients with CSR from ADVENT-HF, that since longer CSR CL and LFCT indicate poorer cardiac function, longer CSR cycling characteristics, and LFCT will be associated with higher mortality.

Methods: In 195 patients with HF (of whom 59 died over a maximum follow-up of 5 years), from 20 CSR cycles (10 in each of the first and last half of the night), we averaged CSR CL from the beginning of 1 apnea to the beginning of the next as well as apnea length, hyperpnea length, LFCT, respiratory rate, oxygen saturation, time to peak tidal volume during hyperpnea, and AHI. Clinical variables entered included sex, age, BMI, left ventricular ejection fraction (LVEF), atrial fibrillation, myocardial infarction, moderate-to-severe mitral regurgitation, New York Heart Association class, and peak-flow-adaptive-servo-ventilation treatment. A random forest feature selection technique was employed. The algorithm then built multiple decision trees, each considering different

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combinations of variables to predict mortality. The importance of a feature is determined by how much the mortality predictions worsen when the values of a feature are randomly mixed. A score above 0.05 indicates importance. Subsequently, we selected the most influential one-third of the features.

Results: The most significant predictors of mortality with importance scores were time to peak tidal volume (0.11), CL (0.10), LVEF (0.09), LFCT (0.09), age (0.09), and an average of maximum oxygen saturation (0.08) achieving a prediction accuracy of 79.5%.

Conclusion: These findings suggest that besides age and LVEF, CSR features related to cardiac output are significant predictors of mortality in HF patients with CSR. Our results underscore the potential significance of detailed polysomnographic analyses to assist in mortality risk stratification in this population.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

222 Treatment considerations in Co-morbid Schizophrenia and Narcolepsy: a case review

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Narcolepsy affects 1 in 2000 people and causes disabling sleepiness¹. Schizophrenia, a common psychotic disorder, affects 1 in 133 people and confers significant impairments across domains². Rates of co-occurrence is not exactly known. One cohort study observed 8.1% of persons with narcolepsy (PWN) as having a psychosis comorbidity and a 4-fold greater risk for psychosis in PWN³. Some alertness promoting medications used in narcolepsy treatment, such as modafinil, methylphenidate and amphetamine, may exacerbate psychosis by increasing dopamine activity. We consulted for a 21 year old man diagnosed with schizophrenia at a mental health hospital. He was admitted for auditory hallucinations and bizarre behaviour (he put his cell phone in his microwave to prevent conversations being overheard). His methylphenidate extended-release 20mg, for a preexisting narcolepsy with cataplexy diagnosis from 9 years prior, was discontinued for concerns that it was exacerbating psychosis. He was previously intolerant to modafinil (emotional numbing) and Concerta (appetite suppression) as per chart review. Paliperidone was effective for psychosis but worsened sleepiness, which was disabling. An inpatient retreat of modafinil worsened auditory hallucinations and delusions of persecution, and discontinued. He

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was discharged on paliperidone IM with well-controlled psychosis. Caffeine was suggested for sleepiness but insufficient in promoting wakefulness. A new pitolisant was initiated to treat sleepiness and cataplexy, and was successful without exacerbation of psychosis. Unfortunately, after 8 weeks of treatment, he lost access to pitolisant for one month due to insurance coverage issues, during which his irresistible sleepiness returned. When a compassionate supply was provided, wakefulness and cataplexy again improved. He remains stable on pitolisant 40mg and paliperidone 75mg IM q4 weekly but has some residual non-disabling sleepiness. In conclusion, traditional stimulants may worsen psychosis in some PWN. Pitolisant, an inverse H3 agonist, may be a safe treatment for sleepiness and cataplexy in comorbid psychosis.

Submission Category | Catégorie de soumission

Sleep, dreams and mental health | Sommeil, rêves et santé mentale

223 Le Sas en Milieu Cardiologique : Experience Inaugurale de Laboratoire du Sommeil en Afrique Sub-Saharienne

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

OBJECTIFS :

Les laboratoires du sommeil sont quasi-inexistants en Afrique Subsaharienne alors que le syndrome d'apnée du sommeil est une réalité mal connue en constante progression. Nous rapportons notre expérience dans la prise en charge diagnostique et thérapeutique de ce facteur de risque cardio vasculaire indépendant.

L'objectif de ce travail rétrospectif est d'établir le profil clinique, paraclinique et polysomnographique de 186 patients africains ayant bénéficié d'un enregistrement nocturne de type 1 avec forte suspicion de SAOS dans le Laboratoire du sommeil SAKINA de Dakar.

MATERIELS ET METHODES :

Nous présentons les données de 186 patients ayant bénéficié d'une vidéo polysomnographie nocturne en milieu surveillée avec auto-questionnaire standardisé du 22 Octobre 2020 au 15 Janvier 2025.

RESULTATS :

Les données démographiques montrent une majorité d'hommes (sex ratio **1,18**) autour de la cinquantaine (âge moyen **48±28**) non obèse (IMC moyen **27**) ayant des FDR CV dans plus de la moitié des cas (HTA 52%, diabète de type 2 21%, dyslipidémie 19%).

Le ronflement et la fatigue matinale dominent le tableau clinique respectivement présent dans 81% et 71%.

Les motifs de consultation cardiologique les plus fréquents ont été malaise itératifs (90 cas) et palpitation nocturne (96 cas).

L'HTA est la comorbidité cardiovasculaire la plus fréquente (HTA **96%**).

Les moyennes des index de l'IAH, désaturations, des micro éveils, des ronflements, des MPJ sont de 29/h, 17/h, 61/h, 222/h, 47/h.

Le SAS est associé à des MPJ (**140** cas), à un syndrome de Cheynes Stokes (2 cas) et à une obésité hypoventilation (1 cas). Un syndrome des jambes sans repos est noté chez 3 patients.

CONCLUSION

L'apnée du sommeil obstructive demeure une réalité sous diagnostiquée dans notre sous-région. Le profil le plus habituel dans notre pratique est celui du sujet jeune, adulte, masculin, non obèse, peu somnolent avec des cofacteurs cardio-métaboliques (HTA, Diabète).

Mots clefs : Syndrome d'apnée du sommeil – PSG – Comorbidités cardio-métaboliques

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

224 The Effects of Acute Evening Moderate-Intensity Exercise on Long-Term Declarative Memory in Sleep Restriction

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Accumulating evidence shows that acute exercise and sleep may synergistically enhance memory.

However, there is limited data from animal and human studies to suggest that exercise may counteract the memory deficits caused by sleep deprivation. We evaluated whether acute moderate-intensity exercise may offset the detrimental effects of restricting nighttime sleep in average sleepers on declarative memory. A total of 88 (52% female) healthy young adults (24.0 ± 3.8 years) were randomly allocated to one of four evening groups: average sleep only (S_8 , 8.5 hours/night), sleep restriction only (S_5 , 4.5 hours/night), and moderate-intensity exercise before sleep restriction (ExS_5) or an average sleep (ExS_8). Groups either performed a 30-minute moderate-intensity exercise or rested in the evening (7:00 p.m.) prior to learning 80 face-name pairs (10:00 p.m.), followed by an immediate recall task (10:10 pm). In the morning after their respective polysomnographic-recorded sleep opportunity, a delayed recall task was administered. The discriminability index (d') during the recall tasks was used to assess long-term memory performance. Total sleep time differed between the average and restricted sleepers ($p < 0.001$). We found significant exercise-sleep interaction effects ($p = 0.048$, $\eta_p^2 = 0.046$) on d' at delayed recall and the difference between delayed and immediate recalls ($p = 0.013$, $\eta_p^2 = 0.071$). The difference in d' of ExS_5 (0.3636 ± 0.7963) was comparable to those of the S_8 (0.2328 ± 1.3714 , $p = 0.699$, $d = -0.116$) and ExS_8 (0.6283 ± 0.6283 , $p = 0.250$, $d = -0.356$), but better than the S_5 (-1.1290 ± 1.02393 , $p < 0.001$, $d = -1.627$). At the delayed retrieval, the d' of ExS_5 was not significantly different from those

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of the S₈ and ExS₈ ($p > 0.05$). These results suggest that acute moderate-intensity evening exercise enhances sleep-dependent memory consolidation and compensates for the detrimental effects of sleep restriction on long-term declarative memory in healthy young adults.

Submission Category | Cat  gorie de soumission

Sleep, brain plasticity and memory | Sommeil, plasticit   c  r  brale et m  moire

227 Do mattress characteristics impact sleep? A systematic review of the literature

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | R  sum  

Background

Insufficient sleep is highly prevalent among adults and children, posing a public health burden due to its negative health outcomes. Environmental factors at the household- and neighborhood-level can potentially influence healthy sleep. Although several mattress companies claim their mattresses improve sleep quality and overall quality of life, these claims lack substantiated evidence. Therefore, we aimed to synthesize the existing evidence on the effectiveness of mattress characteristics on sleep outcomes in children, youth and adults.

Methods

We searched MEDLINE, CINAHL, Embase, PsycINFO, Cochrane Central Register of Controlled Trials, Discovery – Federated Search, Compendex Engineering, Scopus, ProQuest Dissertations & Theses Global from inception to March 5, 2024. We included randomized controlled trials, randomized cross-over trials and observational cohort studies that investigated the effect of mattress characteristics on sleep outcomes in children, youth, or adults. Two independent reviewers screened citations and critically appraised the quality of eligible studies using the

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corresponding JBI Checklist and ROBINS-I tool. Studies were descriptively synthesized and stratified by outcome.

Results

Our search retrieved 3238 articles, and 2090 were screened after removing duplicates. Eighty-seven were eligible for full-text screening, and 23 were critically appraised. We included three randomized controlled trials, ten randomized cross-over trials, and ten observational cohort studies, all rated at high or critical risk of bias. Preliminary evidence from high risk of bias studies suggests that mattress characteristics such as heat capacity, material and structure, rebound properties, firmness, and motion features significantly influence sleep-related outcomes. Improvements were observed in sleep efficiency, duration, stages, and overall sleep quality compared to control groups.

Conclusion

There is a lack of high-quality evidence on the effects of mattress characteristics on sleep quality. The findings from this review will serve as a foundation for generating hypotheses for future high-quality studies aimed at developing a mattress that improves sleep outcomes.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

229 Sleep architecture after ischemic stroke: time for recovery.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

Introduction:

NREM sleep brain oscillations, including slow oscillations (SOs) and spindles, are cortical rhythms that support synaptic plasticity and memory consolidation. Acute stroke negatively impacts sleep quality, but little is known about changes in sleep architecture and NREM oscillations from acute to chronic stages. This study examines SOs and spindles in adults in the acute and chronic phases of ischemic stroke.

Methods:

Two groups of patients with ischemic strokes (NIH Stroke Scale scores [NIHSS] ≤ 5) were analyzed: 17 patients (67.0 \pm 10.2 years; 4 female) in the acute phase (2.9 \pm 2.8 days post-stroke) and 40 patients (59.0 \pm 14.1 years; 11 female) in the chronic phase (127.2 \pm 53.5 days post-stroke). Participants underwent in-laboratory polysomnography to evaluate sleep macro-architecture (wake after sleep onset [WASO], sleep efficiency [SE], duration of wake and sleep stages [N1, N2, N3, REM], sleep fragmentation index [SFI]) and microstructure (automatically detected frontal and central SO and spindle [density, amplitude, duration, and frequency] in NREM (N2+N3)). Linear mixed models were used to examine associations between age, NIHSS score, days post-stroke, and sleep architecture and oscillations. Bonferroni correction was applied.

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Results:

Results showed that age was positively correlated with WASO ($t=4.1$, $p<.001$), wake duration ($t=4.1$, $p<.001$), and SFI ($t=3.7$, $p<.001$), while being negatively correlated with SE ($t=-3.3$, $p<.01$), N2 ($t=-3.5$, $p<.001$), and REM ($t=-3.1$, $p<.01$) durations. NIHSS score was positively associated with N1 duration ($t=3.5$, $p<.001$). Days post-stroke were positively correlated with SO density, frequency, and amplitude (all $p<.001$) and spindle amplitude ($p<.01$). Both age and days post-stroke were negatively correlated with spindle density.

Conclusion:

Findings suggest that sleep architecture and NREM oscillations evolve from the acute to chronic stroke phases, potentially reflecting sleep quality improvements over time with stroke recovery. Future studies should assess if these changes are linked to cognitive recovery.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

230 The impact of insomnia disorder and benzodiazepine use on sleep architecture and brain oscillations in older adults.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1

Abstract | Résumé

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Introduction:

High rates of insomnia in older adults lead to widespread use of benzodiazepines (BZD) and benzodiazepine receptor agonists (BZRA), although chronic use disrupts sleep regulation and impacts cognition. Little is known about the effects of sedative-hypnotics on NREM slow oscillations (SOs) and spindles, including their coupling, which is crucial for memory, especially in the elderly. This study compared NREM brain oscillations in older adults who are good sleepers, those with untreated insomnia disorder, and older adults with insomnia disorder using chronically BZDs/BZRAs.

Methods:

One hundred and one older individuals (66.1 ± 5.8 years; 73% female) were categorized into three groups: good sleepers (GS, $n=28$), individuals with insomnia disorder without sleep aid medication (INS, $n=26$), and individuals with insomnia disorder using BZDs or BZRAs (MED, $n=47$). Participants completed polysomnography to extract sleep architecture (wake and NREM [N2+N3] duration) and automatically detected SO and spindle density, amplitude, duration, and frequency in Fz. Phase-amplitude coupling between SO phase and sigma amplitude was assessed through the modulation index (MI). Groups were compared using ANOVA/Kruskal-Wallis with age as a covariate, applying Bonferroni correction.

Results:

The MED group showed higher N2 and lower N3 duration compared to INS and GS ($p < .001$) and increased wake duration compared to GS ($p < .001$). The MED group had greater spindle density than INS ($p = .01$) but lower spindle amplitude than both INS and GS ($p < .05$). The MED group exhibited longer SO duration compared to GS ($p = .01$) but not INS ($p > .05$), with lower SO amplitude ($p \leq .05$). The MED group displayed slower SO peak frequency compared to GS ($p < .001$) and lower MI than GS ($p < .05$).

Conclusion:

Chronic sedative-hypnotic use worsened sleep quality by prolonging N2 and reducing N3 duration, altering SO and spindle characteristics, and weakening their coupling strength.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

POSTER SESSION 1 - PEDIATRIC POSTERS

46 Interrelation Between Daytime and Nighttime Sleep in Preschool-Aged Children

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Although more than 95% of children still nap at age 2, 94% have ceased napping by age 5. This transition from biphasic to monophasic sleep is still poorly understood, leading to a lack of consensus regarding when naps should be ceased. Indeed, naps seemingly allow young children to meet their total sleep needs, however it is believed they could also delay and reduce nighttime sleep.

Our objective was to analyze the interrelation between objectively measured day and night time sleep in preschool-aged children ([2-5] years). In 2021, 85 children attending French kindergartens were included ($M_{age}=3.8$ years, $SD_{age}=0.56$; 46% girls). Children wore an actigraph during 7.8 days (range:5-13 days).

Compared to weekends, on school-days, naps were more frequent (72% vs 38%) but shorter (62 vs 81 min), and nap bedtime and get-up time occurred earlier (13:45 vs 14:01 and 15:17 vs 16:00) (all $p<0.003$). Compared to nights preceding a weekend, on nights preceding a school-day, nighttime sleep was earlier (bedtime 20:49 vs 21:24, get-up time 7:49 vs 8:16, $p<0.001$), with no difference in duration.

Mixed models indicated that on days where children napped, the following nighttime sleep was shorter ($r=-0.31$, $p=0.002$), however total sleep time (night + day sleep) was longer ($r=0.34$, $p=0.003$). Similarly, having longer and later naps reduced significantly the following nighttime sleep duration. However, on a clinical level, differences were small: a one hour nap reduces nighttime sleep by 13 minutes ($p=0.027$). Nighttime sleep duration did not affect next day nap duration ($p=0.402$).

In conclusion, in our population of preschool-aged children, naps delayed and reduced nighttime sleep, however the effect was clinically inconsequential and naps allowed for a longer total sleep time. They were great differences observed between school-day and weekend sleep, suggesting that sleep habits do not follow sleep needs.

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Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

53 A Qualitative Study Exploring Healthcare Provider Needs and Preferences for an Early Childhood Sleep Education Program

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background. Sleep problems are highly common in young children, affecting 20-30% of infants and toddlers. As such, sleep has been identified as one of the top 10 research priorities for families with young children, and sleep concerns are among the most common behavioural issues reported by parents to healthcare providers (HCPs). Despite the high prevalence of these concerns, HCPs receive very little formal training in pediatric sleep, especially for young children. To fill this gap, the research team is creating the *Promoting Healthy Sleep for Early Childhood* program, an online professional development program for HCPs on sleep in young children.

Methods. A qualitative study was conducted with HCPs from across Canada to better understand their past training experiences and current practices related to sleep in young children, as well as explore their needs and preferences for an online training program in this area. Semi-structured virtual interviews were conducted with 21 HCPs, including physicians, nurses, psychologists, occupational therapists, and social workers. Qualitative responses were analyzed using inductive content analysis.

Results. Preliminary analyses suggest a lack of formal training for HCPs across disciplines and low to moderate confidence in one's ability to assess and treat sleep problems in young children. Several themes were also generated regarding HCPs' suggestions for the content and format of the online training program, including a desire for high-quality research evidence, practical strategies to support families, and additional resources and readings for both HCPs and families.

Conclusion. Study results highlight the importance of a program to fill the gap in HCPs' training and knowledge in pediatric sleep. The findings from this study will be used to create the *Promoting Healthy Sleep for Early Childhood* program, rooted in the needs and preferences of its end-users.

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Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

58 Characteristics and Correlates of Infant Sleep in a Canadian Sample Born During the COVID-19 Pandemic

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Introduction

Infant sleep impacts and is impacted by socio-ecological factors within childbearing families. This study aimed to examine how infants, through their sleep behaviours, can influence and be influenced by their socio-ecological surroundings in the context of the COVID-19 pandemic.

Methods

This study is a secondary analysis of infant sleep data collected by the longitudinal cohort (Pregnancy During COVID-19 Pandemic) study, established in April 2020, to monitor pregnancy and child developmental outcomes throughout the COVID-19 pandemic.

We assessed parent-reported infant sleep using the Brief Infant Sleep Questionnaire-Revised Short Form (BISQ-RSF) at 3 and 12 months postpartum and evaluated correlations between sleep and socio-ecological factors at the micro- (infant and birth parent characteristics), meso- (parent-environmental and family relational measures), and macro-systems (socio-cultural and economic variables).

Results

In this study, 3689 and 4069 parents provided infant sleep data at 3 and 12 months, respectively.

Approximately 10% of parents rated their infant's sleep as a moderate/severe problem at 3 and 12 months. The average time infants needed to fall asleep was 26.4 (+/-18.0) minutes at 12 months,

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which was 7.2 (+/-7.2) minutes less than infants at three months. Total nighttime infant sleep duration at 3 and 12 months of postpartum was 9.69 (+/-1.64) and 10.79 (+/-1.27) hours, respectively. The total score of the BISQ-RSF at 3 and 12 months postpartum were strongly correlated with the infant crying at 3 months (-.312,-.125), birth parent anxiety (-.128,-

.109), depression (-.112,-.099), perceptions of COVID-19 threat (-.125,-.083), and perceived social support (.101, .162). Ethnicity (.084) and household income (.157) were correlated with the total score of BISQ-RSF at 3 and 12 months, respectively.

Conclusion

This study provides up-to-date community-based Canadian data on infant sleep, within the context of the COVID-19 pandemic. Understanding the relationships between infant sleep and socio-ecological factors will help identify risk and protective factors for infant sleep problems.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

62 Caractéristiques Du Sommeil Des Parents Et De Leur Nouveau-Né Prématuré à La Suite Du Congé De L'unité Néonatale

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Jusqu'à 47% des parents expérimentent une altération de leur sommeil après l'intégration de leur nouveau-né prématuré dans le milieu familial. Or, l'ampleur et les caractéristiques des perturbations du sommeil chez ces parents ne sont pas bien documentées. Cette étude vise à décrire le sommeil des prématurés et de leurs parents, un mois après leur intégration dans l'environnement familial.

Une étude quantitative descriptive a été réalisée auprès de 30 familles (29 pères, 31 mères et 39 bébés). Un mois après la sortie de l'unité néonatale, chaque parent a complété les questionnaires suivants : sociodémographique, Indice de qualité du sommeil de Pittsburgh (IQSP) et *Brief Infant Sleep Questionnaire* (BISQ). Les deux parents et le nouveau-né ont porté un actigraphe pendant 3 jours consécutifs et un agenda de sommeil a été complété pour chaque membre de la famille.

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Les résultats à l'IQSP indiquent que les scores des mères ($8,06 \pm 3,13$) et des pères ($7,14 \pm 3,12$) dépassent les seuils cliniques démontrant des difficultés de sommeil significatives. La durée moyenne du sommeil la nuit est de 5 heures (h) 48 minutes (mins) pour les mères et de 6h20 mins pour les pères selon les résultats à l'IQSP, ce qui est inférieur aux recommandations officielles. D'autre part, les nouveau-nés prématurés dorment, en moyenne, 8h 19 mins la nuit, se réveillent 2,97 fois et sont réveillés pendant 1h 40 mins, selon les résultats du BISQ. Les données actigraphiques confirment ces résultats.

Pour conclure, ces résultats confirment l'altération de la qualité et de la quantité du sommeil de ces parents. Vu l'absence de ressources disponibles pour ces familles ayant des besoins particuliers, il est nécessaire de développer des ressources adaptées et individualisées afin de les soutenir adéquatement et les outiller à traverser cette période de transition à la maison teintée par une altération de leur sommeil.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

67 Extreme Pediatric Obstructive Sleep Apnea: Clinical Features, Surgical Management, and Long-Term Outcomes

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background: Extreme obstructive sleep apnea (OSA), defined by an obstructive apnea-hypopnea index (OAHl) >100, presents significant challenges in pediatric patients due to severity and comorbidities. This study aims to review the clinical characteristics, management strategies, and outcomes in this high-risk population.

Methods: A retrospective analysis was conducted on pediatric patients with extreme OSA (OAHl >100) evaluated at the Hospital for Sick Children, Toronto, Canada, from 2010 to 2024. Data

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included demographic characteristics, polysomnography (PSG) results, treatment modalities, surgical interventions, post-operative outcomes, and long-term respiratory support requirements. This study was approved by the Research Ethics Board (REB No. 1000081869) at the Hospital for Sick Children.

Results: Fifty patients (median age: 4.9 years, 64% male) were reviewed. Common comorbidities included trisomy 21 (n=11, 22%), obesity (n=10, 20%), complex neurological disorders (n=10, 20%), and craniofacial syndromes (n=7, 14%). Median OAH was 123.2 events per hour (IQR: 112, 143.1), with nadir SpO₂ at 65.5% (IQR: 52.3, 74.3). Pre-surgical respiratory support was required in 72% (n=36) of cases, and adenotonsillectomy was the primary surgery in 54% (n=27), with 27.3% (n=3) requiring major respiratory support post-operatively. Residual OSA persisted in 77.8% (n=21), and 66% (n=33) required long-term respiratory support. Mortality was 10% (n=5), mainly from respiratory illness (n=4). Risk factors for residual OSA included lower nadir SpO₂ [Adjusted OR 1.1 (1.05, 1.15), p=0.04] and higher ODI [Adjusted OR 1.2 (1.05, 1.5), p=0.04]. Age < 2 years was associated with higher 5-year mortality [Adjusted OR 16.3 (1.39, 23.4), p<0.001], particularly with comorbid craniofacial anomalies and laryngomalacia.

Conclusion: Pediatric patients with extreme OSA face high risks for respiratory morbidity and mortality, especially among younger children with complex comorbidities. Residual OSA and long-term respiratory are common, highlighting the necessity for tailored, ongoing, multidisciplinary management strategies in this vulnerable population.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

70 Sleep Duration, Sleep Quality, and Social Jetlag in Young Children (4-8-years of Age)

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

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Background

Recommended sleep duration (SDur) in 4-8-years-old children is 10-13 hours/24-hours[1]. Most of the literature discussing SDur in children in their natural sleep environment is based on subjective questionnaires which have been found to differ substantially from objective measures[2] and/or actigraphy which tends to over-estimate SDur[3]. Better objective measures in natural sleep environment would allow for more precise evaluation of sleep health in children.

Methods

Secondary analysis of data from single-center population based-cross sectional study in 4-8-year-old children ([NCT05479201](#)), measuring sleep utilizing [FDA-cleared 182618](#)/EU-MDR (CE-2862) compliant home sleep test (SleepImageO, Denver, CO, USA). Participants with full-night high-quality sleep studies on school- and non-school nights (n=200) were included. SDur was calculated as time from sleep onset (SO) until sleep conclusion (SC). Sleep midpoint (SM) compared on school- and non-school nights to calculate social jetlag (SJL). Age-groups were defined as 4-5-years, 5-6-years, 6-7-years and (>7-years).

Results

In all age-groups average SDur is <10-hours, both on school- and non-school nights and gradually declines with age (09:54, 09:49, 09:33, 09:25 hours:minutes).

Children >7-years have significantly shorter SDur compared to younger children: 4-5-years (29-minutes, $p=0.010$) and 5-6-years (24-minutes, $p=0.026$).

SJL gradually increases with age. Except for the youngest (4-5-years), SM is significantly later on non-school-nights compared to school-nights: 5-6-years (31-minutes, $p=0.020$), 6-7-years (34-minutes, $p=0.015$) and >7-years (41-minutes, $p<0.001$).

SQI is significantly lower in the youngest children, -7.6($p=0.007$), -9.4($p=0.001$) and -6.1($p=0.014$).

Conclusion

SDur is compromised in all age-groups. As short SDur has negative effects on mental and physical health including behavior, learning, academic performance and cardiometabolic health in children, educating parents on healthy sleep habits during routine health visits might improve health through better sleep in this vulnerable population.

Children seem to reach their full potential sleep stability around 5-years of age which may be related to age-related development in maturation and integration of subcortical and cortical areas.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

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72 Positional Therapy for the Treatment of Obstructive Sleep Apnea in Children: A Qualitative Study

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background

Positional obstructive sleep apnea (POSA) is a form of obstructive sleep apnea where airway obstruction is exacerbated during supine sleep. Treatments for POSA include adenotonsillectomy, positive airway pressure (PAP) therapy, and positional therapy, an emerging treatment with an inflatable belt that physically prevents supine sleep. To date, little is known about the experiences of children and their caregivers with POSA treatment.

Objectives

This study aims to explore (1) the experiences and perspectives of children and caregivers on positional therapy and (2) their preferences for POSA treatment.

Methods

We conducted semi-structured interviews with the caregivers of children with POSA who participated in a randomised controlled trial evaluating the efficacy of positional therapy. Children were also invited to join the interviews. The interview transcripts were coded by two independent reviewers using thematic analysis. Overarching themes were generated collaboratively.

Results

Five children and 15 caregivers were interviewed. Emerging themes include: (1) comfort and convenience, (2) symptom improvement, (3) emotional, psychological, and social aspects of treatment, (4) shared decision-making, and (5) reaction to treatment options.

Some participants preferred adenotonsillectomy due to its curative potential but was viewed as a last resort by others due to the risk of trauma and complications. While positional therapy was considered the least invasive, it had modest effects on sleep apnea symptoms. PAP provided

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greater symptom relief and was seen as an alternative to adenotonsillectomy. However, barriers to PAP therapy included discomfort with the therapy and the need for nightly implementation.

Discussion

Values and priorities for the outcome of POSA treatment vary between families. These should be identified during initial consultations with healthcare providers to ensure satisfaction with treatment. To optimize adherence to PAP therapy and positional therapy in pediatric populations, sensory issues should be addressed and the setup and maintenance process should be simplified.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

88 Sleep Knowledge of Early Childhood Development Interventionists

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background: Sleep plays a crucial role in child development, yet many children, especially children with developmental difficulties, do not receive evidence-based support for their sleep problems. Early Childhood Development Interventionists (ECDIs) are ideally positioned to pre-emptively inform and educate families of young children with developmental delay (DD), including delays associated with Autism Spectrum Disorder (ASD), about healthy sleep practices. In addition, they could screen for sleep problems and provide appropriate support. However, many professionals in Canada lack formal training on healthy sleep, leaving them ill-equipped to address this important need. **Methods:** An online anonymous survey was distributed to 221 ECDIs from two organizations providing services to children under 5 years old across Nova Scotia. The survey included investigator-designed items in five areas: 1) sleep beliefs, 2) personal sleep habits, 3) understanding healthy sleep, 4) training preferences and 5) participants' basic demographic characteristics. **Results:** Overall, 66.5% of ECDIs responded, with 57% fully completing the survey. Most ECDIs report lacking formal sleep training (72.8%) and independently accessing information on sleep management (52%). Despite this, many ECDIs report being confident in supporting a wide range of families (46.9%) and are aware of the disruptive effects of poor sleep on child development (73.6%). ECDIs preferred interactive training formats—such as asynchronous online modules (69%), video conferencing-based learning (61.1%), and in-person sessions (63.5%)—

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occurring on weekdays (64.3%) as either two 3-hour sessions (47.6%) or one half-day session (54.8%). **Conclusion:** ECDIs are eager to learn more about sleep health, particularly within the context of atypical development, requiring the creation of a training program to meet their needs. Addressing this gap is essential, to equip ECDIs with the knowledge and skills to support healthy sleep and thus optimize the developmental, physical and mental health outcomes for children and their families.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

89 A Good Night's Sleep? The Association Between Neurodevelopmental Disorders and Restless Sleep Disorder

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Sleep disorders are prevalent in children and are associated with behavioral and neurocognitive impacts when untreated. Restless sleep disorder (RSD) is characterized by frequent body movements during sleep resulting in daytime impairment. RSD is diagnosed based on clinical symptoms as well as objective evidence of restless sleep on an overnight polysomnogram and improves with iron supplementation. Despite the frequent comorbidity of sleep disruption among children with neurodevelopmental disorders (NDDs), there is a paucity of data assessing the association between RSD and NDDs. We sought to evaluate the association between RSD and neurodevelopmental disorders in children. This is an interim analysis of a retrospective study of children 6-18 years old who completed a diagnostic polysomnogram at British Columbia Children's Hospital between 12/2023 – 05/2024. Polysomnogram data was evaluated for large muscle movements according to the International Restless Legs Syndrome Study Group standards. NDDs were classified according to the DSM-5. There were 150 children (median age = 11y, females = 57/154 (38.0%)) and 57/150 (38.0%) had a NDD. Overall, 23/150 (15.3%) children had RSD, 48/150 (32.0%) had moderate or severe obstructive sleep apnea, and 2/150 (1.3%) had restless legs syndrome. Of the children with NDDs, 5/57 (8.8%) had RSD whereas 18/93 (19.4%) children without a NDD had RSD ($p = 0.081$). Children with a NDD were more likely to receive iron supplementation (18% with NDDs vs 3.9% without NDDs; $p=0.012$), which may confound the results. In this interim analysis, we did not find an association between neurodevelopmental disorders and RSD. However, children with NDDs were more likely to receive iron supplementation,

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which may confound our results. Data collection is ongoing to better elucidate this relationship. Ultimately, the results of this study will examine the association between neurodevelopmental disorders and RSD to inform the need for the routine assessment of RSD in this population.

Submission Category | Cat  gorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance    l'adolescence

105 Sleep Hygiene Practices and Sports Participation in Preadolescent Girls: A Rapid Review of the Literature

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | R  sum  

Background: Physical activity and sleep are two key factors that significantly influence healthy development, yet fewer than 25% of adolescents meet the 60-minute daily physical activity guideline, and about 25% do not achieve the recommended 9-11 hours of uninterrupted sleep. Organized sports participation can help girls meet physical activity guidelines, while good sleep hygiene practices may promote restorative sleep. Yet, the relationship between sleep hygiene practices and sports participation in pre-adolescent girls remains underexplored, therefore we aimed to synthesize the existing evidence on this relationship.

Method: A rapid review of the literature will be conducted. We registered our protocol with OSF Registries and will report our review according to the 2020 PRISMA statement. We searched MEDLINE, PsychINFO, and SportDiscus from inception to October 2024. We will include cohort, case-control, and cross-sectional studies on the association between sleep hygiene practices and sports participation among pre-adolescent (ages 6 to 12 years) girls. Two independent reviewers will screen citations and appraise the quality of eligible studies using JBI checklists. We will descriptively synthesize the evidence from low and moderate risk of bias studies.

Results: Our database search retrieved 1,226 articles. We will screen titles and abstracts, then conduct a full-text screening of eligible articles. Results will summarize the evidence on sleep hygiene and sports participation in pre-adolescent girls.

Conclusion: Findings from this review will inform the development of an evidence-based toolkit for a broader project aimed at enhancing girls' participation in sports. This toolkit will be evaluated

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through a pre- and post-intervention study to assess its effectiveness in improving sports participation, reducing attrition, implementing sleep hygiene practices, and enhancing enjoyment of sport among pre-adolescent girls. The review aims to provide valuable insights that will contribute to healthier lifestyles and increased sports engagement for pre-adolescent girls.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

114 Childcare Arrangements Associated With Nap Duration at 3.5 Years of Age: A Birth-Cohort Cross-Cultural Comparison Between Quebec (ELDEQ) and France (ELFE)

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Context. Nap duration varies across preschool years. No study has investigated associations between childcare arrangements and nap duration between cohorts from different cultural background.

Objective. To examine whether childcare arrangements (1-unstructured with family members, 2-semi-structured in family daycares, 3-structured in a center-based childcares or schools) are associated with nap duration at 3.5 years old.

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Method. Data are based on maternal reports from ELDEQ (n=1950) and ELFE (n=12236). Multinomial logistic regression models were adjusted for child (sex, age, breastfed, nighttime duration, bedtime), maternal (immigrant status, age, education) and family characteristics (siblings, income).

Results. In Quebec, 30% of children attended a structured childcare arrangement compared to 73% of children in France. At 3.5 years old, 37% in Quebec Vs 8% in France took no nap or <1h, 52% in Quebec Vs 58% in France napped from 1h to 2h, and 11% in Quebec Vs 34% in France napped ≥2h. Compared to children in a structured childcare arrangement, children in a unstructured arrangement had 3.26 (Quebec, 95%CI=2.25-4.71) or 5.03 (France, 95%CI=4.26-5.93) times the odds of taking no nap or a short one and children in a semi-structured arrangement had 1.83 (Quebec, 95%CI=1.32-2.53) or 2.16 (France, 95%CI=1.60-2.93) times the odds of taking no nap or a short one compared to children who napped from 1h to 2h. In France, children in an unstructured arrangement had 2.95 (95%CI= 2.65-3.29) times the odds of taking a long nap and children in a semi-structured arrangement had 3.41 (95%CI=2.93-3.97) times the odds of taking a long nap compared to children who napped from 1h to 2h.

Conclusion. Attending a childcare arrangement other than a structured one is associated with short nap duration (Quebec and France) or long nap duration (France) at 3.5 years old compared to children who napped from 1h to 2h.

Supported by Programme Samuel-de-Champlain (FRQ).

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

120 Identifying and Addressing Barriers to Treatment Adherence in Pediatric Users of Home Non-Invasive Respiratory Support

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

At BC Children's Hospital, the Home Tracheostomy and Ventilation (HTV) clinic supports approximately 130 children and youth using home non-invasive ventilation (NIV), CPAP/BiPAP, for a range of indications. Our institutional experience and prior literature suggest that suboptimal adherence with therapy is common, particularly during the initiation period, and may disproportionately affect certain patient groups. Our project aimed to identify the prevalence of suboptimal adherence with NIV in the HTV clinic population and characterize barriers versus protective factors to adherence.

We conducted a five-year retrospective chart review exploring NIV adherence patterns amongst eighty pediatric patients, aged 2-18 years. Patient characteristics, initiation factors, barriers to adherence, treatment changes, and reasons for discontinuation were recorded across four follow-up time points (1st FU, 2nd FU, 3rd FU, and long-term FU), spanning a minimum of 18 months.

Our study demonstrated that while average NIV usage increased from 5.53 hrs/night at the 1st FU to 7.28 hrs/night at LT FU, the majority of patients were only partially adherent. Notably, 21% of patients terminated treatment due to non-adherence. Among these patients, 56% were already completely non-adherent at the 1st FU, with most discontinuing between 2nd and 3rd FU visits. Genetic/syndromic, neuromuscular, or neurological diagnoses were most common in non-adherent patients. Key barriers to adherence, consistent across time points, were behavioural challenges, treatment burden, and mask discomfort. Other factors impacting adherence included patient demographics, initiation settings, and nursing support availability. Strikingly, females were more likely to be fully adherent (usage >70%), and males partially adherent ($p=0.042$).

This chart review revealed that non-adherence with NIV is highly prevalent in BC's pediatric population, especially among those with neuromuscular/developmental comorbidities, behavioral challenges, and limited home support. Our findings will inform a quality improvement initiative aimed at enhancing adherence through the implementation of specialized care teams, follow-up optimization, and tailored educational tools.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

139 Socio-ecological Predictors of Nap Cessation in Early Childhood

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background: Napping is a common feature of early childhood sleep patterns. As children mature, their sleep undergoes a notable transition: the cessation of daytime naps. This shift from biphasic to monophasic sleep varies among children and is influenced by individual, familial, and environmental factors (Meltzer et al., 2021). Previous research has explored child-level characteristics associated with nap cessation, such as age, sex, development, and ethnicity (Spencer et al., 2016; Newton & Reid, 2023). Few studies have examined distal factors, including family dynamics and broader environmental influences.

Objective: To explore predictors of nap cessation.

Participants: Parents of children aged 1 to 6 at baseline with available sleep data at 6-month follow-up (N = 127).

Methods: Parents completed online surveys on their children's daytime and nighttime sleep, along with family demographics and their own nap behaviours. Data were analyzed using binary logistic regression to identify predictors of nap cessation, focusing first on established predictors and then on exploratory predictors.

Results: In Step 1, weekly nap duration significantly influenced nap cessation (OR = 0.994; 95% CI = 0.991 – 0.998), indicating each additional minute of napping reduced the odds of cessation by 0.6%. Step 2 revealed that children with high nighttime sleep problem scores had a reduced likelihood of nap cessation (OR = 0.036, 95% CI = 0.003 – 0.492). Age, sex, ethnicity, developmental stage, parental occupation, and attitudes toward napping did not show significance.

Conclusion: This study enhances understanding of the influences underlying nap cessation in early childhood. Findings illuminate the mechanisms involved by elucidating the roles of nighttime sleep problems and nap duration. Continued exploration of socio-ecological factors is essential for refining strategies that support the transition from biphasic to monophasic sleep patterns.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

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143 Sleeping Around: How Sleeping Arrangements in Infancy are Associated with Sleep-Wake Patterns Across Early Childhood

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Introduction: Sleeping arrangements in infancy (solitary sleep, bedsharing, and room sharing) seem to influence sleep-wake patterns, but the literature remains contradictory and lacks longitudinal data. We explored the association between sleeping arrangements at 6 months and sleep-wake patterns between 6 and 36 months.

Methods: 444 mother-infant dyads from the Maternal Adversity, Vulnerability and Neurodevelopment cohort were included. Infants were divided into three groups based on sleeping arrangements at 6 months. Maternal reports of the longest period of consecutive sleep, total nocturnal sleep duration, and total sleep over 24 hours at 6, 12, 24, and 36 months were used. Generalized estimating equations with Bonferroni adjusted pairwise comparisons were conducted to assess the associations between sleeping arrangements and the different sleep variables, with SES, maternal depressive symptoms, and breastfeeding status at 6 months as covariates.

Results: At 6 months, infants in the solitary sleep group had significantly longer periods of consecutive sleep ($M=7.72\pm.18$, $n=250$) than room sharing infants ($M=6.20\pm.28$, $p<.001$, $n=79$) and bedsharing infants ($M=4.97\pm.35$, $p<.001$, $n=40$). At 12 months, infants in the solitary sleep group ($M=8.70\pm.17$, $p<.001$) and in the room sharing group ($M=7.12\pm.46$, $p=.012$) had significantly longer periods of consecutive sleep than bedsharing infants ($M=4.76\pm.43$). There was no difference in nocturnal sleep duration between groups at any time points (6-36 months). At 12 months, infants in the solitary sleep group had significantly longer total sleep durations ($M=13.26\pm.08$) than their bedsharing counterparts ($M=12.33\pm.26$, $p=.046$). Similar results emerged at 24 months ($p=.004$). All other comparisons between sleeping arrangement groups were non-significant ($p>.05$).

Conclusions: The findings suggest that sleeping arrangements are only associated with sleep-wake patterns in infancy but do not persist overtime. Future studies could explore how sleeping arrangements may also impact the sleep of parents.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

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160 Communication Quality and Harm Reduction in Public Health Resources About Co-Sleeping With Infants

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Introduction: Co-sleeping, which refers to the practice of parents sharing a bed with their infants, is a controversial topic and is highly influenced by culture. On one hand, this practice has many benefits to parents, namely facilitating breastfeeding. On the other hand, in Western countries, this practice is stigmatized, due in part to links with sudden infant death syndrome. Some parents face criticism about their choice to co-sleep with their infant and hide this practice from healthcare providers for fear of being judged. The role of public health materials about infant sleep is therefore crucial in educating parents non-judgmentally about safer sleep practices so they are empowered to make informed decisions.

Objective: The first objective of this study was to describe the communication quality of public health information available to Canadian parents about co-sleeping. The second objective was to evaluate if the available resources take a harm reduction approach, meaning they offer suggestions for how to make co-sleeping safer, or if they advise against it entirely.

Methods: We identified and scored infant sleep resources aimed at parents from Canadian public health organizations according to the CDC Clear Communication Index, a measure of communication quality and accessibility of information, and whether these resources took a harm reduction approach.

Results: Preliminary results showed out of 132 infant sleep resources, 92 resources (69.70%) discussed co-sleeping. Co-sleeping resources had a mean communication quality of 68.53%, which is considered sub-satisfactory. Only 46.7% of co-sleeping resources took a harm reduction approach.

Conclusion: These preliminary results indicate that most public health resources available to Canadian parents about co-sleeping lack sufficient communication quality, and most resources do not take a harm reduction approach to co-sleeping. This means parents lack access to high-quality information about how to minimize risks when co-sleeping.

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Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

166 “Are They Sleeping Through the Night?” Are Mothers’ Perceptions of Infants’ Sleep Associated with Objective Measurements?

Ms. Michelle Ly^{1,2}, Ms. Raphaëlle Lafond-De-Courval^{3,2}, Dre. Marie-Julie Béliveau^{3,2}, Dre. Karine Dubois-Comtois^{4,2}, Ms. Marjolaine Chicoine², Dre. Marie-Hélène Pennestri^{1,2}

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background: New parents are often concerned with whether their infant is sleeping through the night. In the literature, sleeping through the night is often defined as sleeping for 6 uninterrupted hours without parental intervention. However, it is unclear how parents define sleeping through the night and their perception or definition might differ from clinicians/researchers. This project aimed to assess differences in objectively measured sleep patterns between infants who are described as sleeping through the night by their mother and infants who do not.

Methods: At 6 months postpartum, 50 mothers reported the age at which they considered their infant to be sleeping through the night (Sleep Practice Questionnaire). Infants were divided into two groups: (1) sleeping through the night at 6 months and (2) not. At 6 months, infant nocturnal sleep duration and duration of wake after sleep onset (WASO) were measured by actigraphy over 12 nights. Mann-Whitney U tests were conducted to assess differences in nocturnal sleep duration and WASO between the two groups.

Results: 29 (58%) mothers reported that their infant was not sleeping through the night at 6 months. Infants in the sleeping through the night group had a slightly lower nocturnal sleep duration ($M=523.53\pm60.22$ min) than infants who were not sleeping through the night ($M=543.09\pm49.32$) but this difference was not statistically significant ($p=0.177$). There was no significant difference in WASO between infants who were reported to sleeping through the night ($M=57.81\pm26.13$) and those who were not ($M=62.05\pm22.74$), ($p=0.385$).

Conclusion: At 6 months, more than half of mothers reported that their infant was not sleeping through the night. Based on these preliminary results, objective sleep patterns are not associated

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with maternal perception of their infant sleeping or not through night. Future analysis could identify what other sleep variables, or maternal/ environmental factors could contribute to this perception.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

170 The Association Between Insomnia and Positive Airway Pressure Adherence in Children

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Introduction: Sleep-disordered breathing is often treated with positive airway pressure (PAP) therapy, but effectiveness is limited by poor adherence rates of less than 50% in children. The impact of insomnia on PAP adherence in children has not been established; this is relevant as treating insomnia may facilitate PAP adherence and improve clinical outcomes. We sought to examine the association between insomnia and PAP therapy adherence in children.

Methods: This is a cross-sectional study of children and adolescents aged 8-18 years old prescribed PAP therapy for a minimum of six months. The primary exposure was insomnia, defined as a score of 9 or higher on the self-reported Insomnia Severity Index questionnaire. The primary outcome was average minutes of PAP therapy usage measured on a 180-day PAP download. The secondary outcomes were percentage of total sleep time using PAP and percentage of days using PAP >4 hours/night. The data was analyzed using linear regression models adjusted for age and gender.

Results: A total of 80 participants were included (females = 31%, median age = 15.0 years, continuous PAP = 60%, median duration of PAP use = 40.9 months). Twenty-eight of 80 participants (35%) had insomnia. Participants with insomnia used PAP therapy for 232.8 minutes/night less than participants without insomnia (95% CI 146.2 to 319.4 minutes/night; $p < 0.001$). The percentage of total sleep time using PAP was 42.8% (95% CI 26.5% to 59.8%; $p < 0.001$) less in

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participants with insomnia. The percentage of days using PAP >4 hours/night was also significantly lower in children with insomnia by 43.5% (95% CI 27.2% to 59.9%; $p<0.001$).

Conclusions: Our study suggests that insomnia symptoms are associated with reduced PAP adherence in children. Prospective studies to confirm the association between baseline insomnia and PAP adherence in children are required.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

179 Multiple Sleep Latency Tests Results in Pediatric Hypersomnolence: A Descriptive Study

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background: Excessive daytime sleepiness (EDS) is common in children and is often assessed using adult-based Multiple Sleep Latency Test (MSLT) criteria per AASM guidelines, which may not accurately capture pediatric sleep physiology. This study aims to describe PSG-MSLT results in patients with narcolepsy and idiopathic hypersomnia and analyze indeterminate cases to assess any correlation between MSLT findings and baseline PSG.

Methods: A retrospective analysis of MSLTs conducted at a single pediatric center from 2014 to 2024. Narcolepsy was defined as a mean sleep latency (MSL) of ≤ 8 minutes with ≥ 2 sleep-onset REM periods (SOREMs). Idiopathic Hypersomnia (IH) was defined as an MSL of ≤ 8 minutes with < 2 SOREMs. Patients with an indeterminate MSLT were identified as those with an MSL > 8 minutes and < 2 SOREMs.

Results: A total of 120 patients underwent PSG-MSLT, of whom 78 (65%) were male, with a median age of 11 years (range 3.3–18). Seven patients repeated the test once, 2 repeated it twice, and 1 repeated it 3 times. Fifteen patients (12.5%) had a diagnosis of Prader-Willi syndrome. A total of 58 patients (48%) had a normal MSL of 20 minutes, with no sleep observed on any nap. Among the

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remaining 72 patients, 40 (55.5%) were diagnosed with narcolepsy, of whom 14 (35%) had type 1 narcolepsy with cataplexy. Nineteen patients (26.4%) were diagnosed with idiopathic hypersomnia, while 13 patients (18.1%) had indeterminate PSG-MSLT results, not meeting full MSLT criteria due to an MSL over 8 minutes or fewer than 2 SOREMs.

Conclusion: In our cohort, a high number of patients were diagnosed with narcolepsy using current MSLT criteria. However, additional diagnostic parameters and data are needed to characterize indeterminate cases more accurately in children.

Keywords: pediatrics, narcolepsy, hypersomnolence, Multiple Sleep Latency Test, idiopathic hypersomnia, sleep diagnostics

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

190 The Impact of Parents' Everyday Discrimination on Infant Sleep: Evidence from The National Health Interview Survey

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Introduction: Infant sleep deficiencies are associated with adverse health outcomes, including compromised mental functioning, brain development, emotional states, and learning. Whether parents' perceived discrimination affects infant sleep has not been comprehensively investigated at the national level.

Methods: Data from the 2023 National Health Interview Survey of 441 mothers and 313 fathers were used. Associations among parents' perceived discrimination with sleep disturbances of 754 infants aged ≤ 12 months were examined using Generalized structural equation modeling. Ordinal outcomes were: (1) troubles falling asleep: "Is it hard to put your child to sleep?" and (2) staying asleep: "Does your child have trouble staying asleep?", with responses "not at all" (N), "somewhat" (S), "very much" (V). Exposure was self-reported discrimination measured using the Everyday Discrimination Scale (range 0-20), which assesses frequency of being treated with less courtesy, receiving poor service, being treated as not smart, being feared, and experiencing harassment. Covariates were: Child: biological sex and general health status. Parent: age, marital status,

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education, employment, nativity, federal poverty level, number of children in the household, and metropolitan size.

Results: Endorsement rates for trouble falling asleep were: N=83.1%, S=13.2%, and V=3.7%, and for trouble staying asleep N=83.1%, S=13.6%, and V=3.3%. Female parents with higher levels of everyday discrimination had infants who were 1.11 times as likely to experience at least some trouble falling asleep (OR:1.11; [CI:1.02,1.22]) or 1.09 times as likely to experience at least some trouble staying asleep (OR:1.09; [CI:1.00,1.18]). Male parents with higher levels of everyday discrimination had infants who were 1.17 times as likely to experience at least some trouble falling asleep (OR:1.17; [CI:1.00,1.372]); however, their perceived levels of everyday discrimination were not significantly associated with infant sleep maintenance.

Conclusion: Future work is needed to better understand the mechanisms behind the associations between parents' experiences of discrimination and their child's sleep quality.

Submission Category | Catégorie de soumission

Sleep equity | Équité face au sommeil

191 Active Involvement of Children in ADHD Randomized Control Trials Assessing Sleep - an Issue of Perspectives?

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Introduction

Sleep is rarely reported as an outcome in pediatric ADHD trials and parental consent and by proxy outcome reports are still preferred over active child involvement. The goals of this analysis are to determine if children were actively involved in RCTs for ADHD with sleep as an outcome, and what kind of pediatric patient reported tools were used.

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Materials and Methods

We performed a secondary analysis of a dataset from a previous scoping review (DOI 10.17605/OSF.IO/VWRPT) aimed to identify interventional ADHD RCTs that measured sleep as a primary or secondary outcome. In 52/71 RCTs carried out in pediatric populations between 1995-2020, comprising 5475 subjects aged 2-17 years (mean= 9.5 years), we analyzed childrens' involvement in the consenting process and in reporting outcomes of sleep, ADHD/miscellaneous behaviours and adverse effects (AE).

Results

Children gave assent or child consent in 69% of studies, and reported outcomes in the domains of sleep, ADHD, miscellaneous behaviours and AE in 25%, 8%, 4%, and 70% of RCTs. Children were more frequently involved in reporting of night time (sleep) outcomes vs daytime (ADHD) outcomes (13 vs 5 RCTs). Of all outcome reporting tools applied, 41%, 6%, 22% and 50% of tools were for child self-reports of sleep, ADHD, miscellaneous behaviours and AE reporting.

Conclusions

A consensus approach to obtaining consent/assent and to use validated pediatric patient reported outcomes measures will promote high quality pediatric RCTs doing justice to the United Nations' Convention on the Rights of the Child.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

202 Are 6-Month-Old Infants Sleeping Enough?

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

Objective: The National Sleep Foundation (NSF) recommends infants aged 4 to 12 months to sleep for at least 12 hours per 24-hour period. However, considerable differences in total sleep duration between infants are observed. While there is also important day-to-day intra-individual variability, few studies have explored this phenomenon. Therefore, the present study aimed to 1) document the proportion of 6-month-old infants reaching the 12-hour recommendation daily and 2) describe the day-to-day variability of total sleep duration across a period of 13 days.

Methods: 44 typically developing infants (22 girls) were analyzed. Infant sleep was recorded at 6 months old using actigraphy over 13 consecutive days and nights. The NSF recommendation of at least 12 hours of total sleep duration over 24 hours was used to identify infants reaching the minimal total sleep duration (12 hours) at 6 months. Descriptive statistics were generated to describe the day-to-day variability.

Results: On average, infants slept at least 12 hours out of 24 hours for 6.6 out of 13 days (50.8%; Min=0, Max=13, $SD=3.5$). Two infants (4.5%) never reached the 12-hour criterion during this period. Only one infant (2.3%) met this criterion daily. However, most infants ($n = 41$; 93.2%) showed high variability between the days, sometimes reaching the 12-hour NSF recommendation, sometimes not.

Conclusions: These preliminary results suggest that there is important intra-variability in total sleep duration in 6 months-old infants, measured with actigraphy. While on average infants reached the 12-hour recommendation on half of the study days, the total sleep duration varied importantly across infants and from day to day. Moreover, only one infant reached this recommendation for the entire study duration. External factors (e.g., household size, feeding methods) and internal factors (e.g., cognitive and motor development milestones) may influence an infant's total sleep duration and variability; these factors will be further investigated.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

203 Characterizing Inflammation of Nasal Epithelial Cells in children with OSA

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background: Obstructive sleep apnea (OSA) is a sleep-related breathing disorder that is also considered a chronic inflammatory condition, characterized by upper airway inflammation. Primary human nasal epithelial cell (HNEC) cultures provide a model to study upper airway physiology and inflammation. However, the role of these cells in pediatric OSA and their inflammatory profile remains poorly understood. **Objective:** This study aimed to characterize the inflammatory profile of HNECs in children with OSA vs. healthy controls at baseline and post-viral stimulation. **Methods:** HNECs were collected from children with OSA and healthy controls. Cells were cultured under air-liquid interface (ALI) conditions for 4 weeks then infected with 0.5 MOI RSV. Cytokine expression of IL-6 and IL-8 in the basal media was quantified using Luminex. Morphology was described using immunohistochemistry. **Results:** Week 1 baseline median IL-6 levels were significantly higher in the control group compared to the OSA group ($p=0.047$) (OSA: 61.98 ± 31.34 vs. controls: 240.20 ± 68.92). At baseline, IL-6 production followed a consistent pattern in the OSA group, with levels peaking at week 2, before steadily declining through week 4. There was no significant difference in IL-6 and IL-8 cytokine concentrations within OSA and control groups over the 4-week baseline. However, high heterogeneity was observed between individual subjects. Post-infection, there was no significant difference in IL-6 and IL-8 concentrations between the OSA and control groups. **Conclusion:** Further studies are needed to explore the inflammatory mechanisms of OSA due to the small sample size, which may provide insights into potential anti-inflammatory treatments.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

204 Examining Correlates of Spontaneous Napping in Young Children

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The University of Western Ontario, London, ON, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background: Sleep patterns change significantly from birth to 6-years-old, especially napping. A recent study identified a novel aspect of napping in young children; i.e., 15.4% of children were Spontaneous Nappers. This group of spontaneous nappers was characterized by relatively later nap timings, shorter durations and a low frequency of napping, with the majority (75%) of children in this profile napping less than 1 day per week. Taken together, Spontaneous Nappers were seen to have few, short, later timed and largely unplanned naps.

Gap within literature: Within the pediatric sleep literature, there is little research on the developmental sequence of spontaneous napping. This research is the first to examine nap spontaneity as its primary focus, addressing a significant gap in the literature. Only one previous study has included nap spontaneity as a variable, but it was not the main purpose of the research.

Aims: To identify the child- (e.g., sex, age, nap behaviors, nighttime sleep patterns, psychopathology), familial- (e.g., psychopathology, sleep-related cognitions, parenting practices, home environment), and environmental- (e.g., childcare arrangements)- correlates of nap spontaneity.

Methodology: Secondary data analyses are being conducted on two nationally representative datasets of young children. Both cross-sectional studies examined have retrospective parent-reports and 1 week of sleep diaries ($N = 197$, Study 1; $N = 470$, Study 2) for children (aged 2 to 6, Study 1; 1.5 to 6, Study 2) residing in Canada.

Analyses: Descriptive statistics will summarize key demographics and nap parameters. A logistic regression will be used to examine predictors of nap spontaneity. A cross-lagged panel design will explore the relationship between nighttime sleep and daytime nap behaviors. Intra- and inter-child variation will be examined.

Implications: Findings will contribute to academic knowledge and inform evidence-based guidelines on in-home naptime practices and childcare naptime policies.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

206 Dexamethasone as a Novel Treatment for Obstructive Sleep Apnea in Children

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background: Obstructive sleep apnea (OSA) is a sleep-related breathing disorder, characterized by upper airway obstruction. The first-line treatment for OSA is an adenotonsillectomy (AT), however, there are long surgical wait times. Consequently, many children are untreated for OSA leading to a higher risk of long-term effects on health. OSA is also a chronic inflammatory condition and presents as upper airway inflammation, however, oral anti-inflammatory treatments such as dexamethasone have not been fully explored. **Methods:** This randomized, double-blinded, placebo-controlled trial compared a 3-day course of dexamethasone (0.5 mg/kg, max. 8 mg/day) to a placebo control in children between the ages of 2-10 diagnosed with moderate to severe OSA (≥ 5 Obstructive apnea-hypopnea index (OAHI)). Polysomnograms (PSGs), otolaryngology assessments, and qualitative questionnaires addressing OSA symptoms and neurobehavior were administered at baseline, 2 weeks and 6 months after the intervention. **Results:** A total of ten participants without surgical treatment of OSA were recruited: 5 received dexamethasone (median age: 4.0 years [2.5, 7.0], 60% male) and 5 received a placebo (median age: 4.0 years [2.5, 8.0], 20% male). The change in the OAHI 2 weeks post-intervention showed no significant difference between the groups. The dexamethasone group had a median change of 0.1 events/hour, while the placebo group showed an increase of 2.1 events/hour ($p=0.056$). Within the OSA group, 40% of participants saw a clinically significant 50% decrease in OAHI 2 weeks post-intervention. Tonsil size changes and questionnaire total scores showed no significant differences between the groups. At the 6-month follow-up, the initial reduction in OAHI in the dexamethasone group was not sustained, with median OAHI worsening compared to baseline. **Conclusions:** The small sample size limits definitive conclusions on dexamethasone efficacy. Further studies in larger populations are needed before implementing in clinical practice.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

226 The role of tryptophan in insomnia in children and adolescents

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Insomnia and parasomnias in children are prevalent conditions having a significant impact on their cognitive, emotional and behavioral development. As pharmacological treatments raise concerns regarding safety and dependence, L-Tryptophan presents a safe “non-medication” intervention. L-Tryptophan, a precursor of serotonin and melatonin. It is associated with improvements in sleep onset, sleep maintenance and parasomnias. These benefits are seen at varying doses. This study aimed to evaluate the effectiveness of L-Tryptophan in reducing sleep onset latency, maintaining sleep continuity and improving parasomnia symptoms in children and adolescents aged 6 to 16 years (many of whom had co-morbid conditions such as ADHD, autism, and restless leg syndrome). A total of 200 participants from the Youthdale Sleep Clinic in Ontario, Canada, were involved in a multi-phase study, including clinical consultations, polysomnographic (PSG) evaluations, and follow-up visits over a three-month period. Participants were administered L-Tryptophan at an increasing dose based on age, with younger children starting at 500 mg and older children starting at 1 g, gradually increasing to a maximum of 3 g and 6 g, respectively. Clinical interviews assessed sleep improvement, parasomnia and mood. The results indicated that L-Tryptophan supplementation significantly improved sleep architecture and enhanced sleep efficiency. It was found that with smaller doses, tryptophan is effective for parasomnia and in larger doses it was effective for insomnia. These findings support the use of L-Tryptophan as a potential therapeutic approach, with a limited side effect profile for pediatric insomnia and parasomnia.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

232 Melatonin in children with neurodevelopmental disorders and disrupted sleep - review of the outcome measures used in randomized controlled trials

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Introduction: Melatonin is commonly prescribed for addressing disrupted sleep in children and adolescents with neurodevelopmental disorders (NDDs). As suggested by the The International Paediatric Sleep Association (IPSA), melatonin may be effective in NDD cases with chronic insomnia, where first line behavioural interventions have not been effective, though evidence for the use of melatonin in the paediatric population is limited.

Methods: A review of melatonin randomized controlled trials (RCTs) was carried out using studies in children with NDDs identified in statements from IPSA and the German Sleep Society (DGSM, Deutsche Gesellschaft für Schlafforschung und Schlafmedizin). Outcome measures of the included RCTs were analyzed and questionnaires were categorized based on incorporated sleep and sleep/wake-related domains.

Results: 18 RCTs were included in this review. 16/18 RCTs reported quantitative variables from sleep diaries and/or actigraphy, the most common of which were sleep onset latency (16/16), total sleep time (16/16), and number of awakenings (14/16). Questionnaires were primarily used as secondary outcomes. Domains captured from questionnaires included daytime behaviours (n=8 questionnaires), daytime sleepiness (n=7), nighttime awakenings (n=5), and bedtime/transitions (n=5).

Conclusions: Assessment strategies for disrupted sleep and outcome measures of the included paediatric melatonin RCTs were heterogeneous with regards to captured sleep and sleep/wake-related domains. These results highlight the need for a consensus approach to the assessment of sleep in children with NDDs for capturing disrupted sleep in a reproducible way.

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Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

234 How can we best modify the Healthy Sleep for Healthy Schools Program, so it is suitable for Elementary School Settings?

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Introduction: Children develop their health habits from a young age, and evidence shows that 1 in 5 school aged children are not sleeping enough. Despite this, sleep is often not included as a formal component of school curriculum. The vast majority (~85%) of published school-based sleep education programs have been taught in high schools. To ensure that elementary school-aged children develop healthy habits early, learning about the importance of sleep for their overall health is critical. The Healthy Sleep for Healthy Schools program is a multi-phased, multi-component program originally developed for high school teachers and students. It is aimed at not only improving students' knowledge of sleep but also supporting sustainable behavioural changes in their sleep habits.

Aim: Obtain qualitative feedback on the HS4HS program from elementary school teachers to address the following research questions: 1. What changes need to be made to the HS4HS platform to meet the needs of elementary school teachers. 2. What types of resources need to be developed to support teachers in their delivery of sleep education in elementary schools.

Methods: Online focus groups and individual interviews are currently being conducted with ~15 Australian and ~15 Canadian elementary school teachers. Data collection is scheduled to be completed in February 2025. Teachers are asked to review the HS4HS high school program (AUS) and the ABCs of SLEEPING storybook (Canada) to provide context for their participation. Reflexive thematic analyses will be undertaken.

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Results: Preliminary findings suggest elementary school teachers require more focus on healthy sleep practices upfront and would utilise age-appropriate resources such as picture books, or brief videos. Final analyses will be available at the conference.

Discussion: Findings from this study will inform the modification of the HS4HS-Elementary program. A usability and pilot study for HS4HS-Elementary will be completed in Australia and Canada in 2025.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

237 IMAGINE Sleep in hospital and at home - Introducing Meaningful Adaptations Guided by and Informing Evidence to support sleep in hospital and at home

Ms. Victoria Foxall¹, Ms. Momina Raja², Mr. Danny Nunes², Dr. Isabel Smith^{1,2}, Ms. Stacy Fraughton¹, Ms. MacKayla Williams², Ms. Tara Naimpally¹, Dr. Joanna Holland^{1,2}, Ms. Theresa Clemens¹, Dr. Megan Thomas^{1,2,3}

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background - There is a growing body of evidence that patients, including children and their co-resident carers, often experience sleep disruptions during hospital admissions due to environmental, institutional, and care provider factors. Despite this knowledge, minimal changes to these factors have been systematically implemented to improve sleep opportunities. Hospital admission also provides an important opportunity to identify and address factors affecting children's healthy sleep at home.

Aim – To co-design interventions with parents/carers and healthcare providers to support pediatric patients' and their co-resident carers' sleep during hospitalization and when they return home following discharge.

Methods - Separate focus groups with parents/carers (n = 4) who had accompanied their child for 5 to 30+ hospital admissions, and with healthcare providers (n = 6) from the Pediatric Medical Unit at the IWK Health Centre representing a range of roles, were held. The Appreciative Inquiry framework guided focus group discussions that were facilitated by a parent research partner,

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recorded and transcribed verbatim. Areas for intervention were prioritized and strategies to achieve meaningful change to support patients' and carers' sleep opportunities were co-designed. Data outputs were subjected to thematic analysis and an intervention plan was refined through guidance from the Project Advisory Committee and Parent Advisory Committee.

Results - We will present a multi-level intervention plan targeting the environmental, child and family, healthcare provider, and institutional levels to support families' sleep in hospital and at home.

Conclusion - The plan provides a model that can be adopted in other inpatient units to improve sleep quality and quantity for children and their co-resident carers, promote families' satisfaction with care, and support the identification of existing sleep problems and establishment of healthy sleep routines on discharge home. The plan will be evaluated and refined using the RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework during 2025.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

238 A Delphi Survey of International Experts: Standards to Support Healthy Sleep in Hospital

Ms. Tara Naimpally¹, Dr. Catherine Hill², Dr. Andrea Fidler³, Dr. Kate Ching-ching Chang⁴, Dr. Guanghai Wang⁵, Dr. Robyn Stemler⁶, Dr. Nicola Orlov⁷, Dr. Sapna Kudachadkar⁸, Dr. Moya Vandeleur⁹, Dr. Saadoun Bin-Hasan¹⁰, Dr. Megan Thomas¹

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background: Sleep disturbances during hospital stays significantly impact the recovery and well-being of pediatric patients and their co-resident caregivers. Despite evidence of these challenges, systematic improvements in hospital environments remain limited. This study, led by an International Pediatric Sleep Association (IPSA) Taskforce of 10 sleep experts from Canada, US, UK, Australia, China, Hong Kong and Kuwait, aims to establish consensus on the most important

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standards for advocacy on promoting healthy sleep in hospital settings globally. **Methods:** The study utilised an e-Delphi Survey methodology to achieve expert consensus on sleep standards in pediatric hospital settings. The first round of surveys was distributed globally to members of IPSA. Participants rated 32 proposed standards addressing factors such as noise reduction, light regulation, and care schedules. Open-ended questions captured additional recommendations. Respondents were given the opportunity to share contact details and profession. From this information, a subset of respondents was identified providing a broad geographical and professional representation, to respond to the next two rounds of the survey. Round 2 involved further refinement and agreement and Round 3 will include ranking each of the agreed standards in order of priority. **Results:** Seventy-two participants from 23 countries and 10 different professions responded to Round 1 and all provided contact information. There was strong support for all the proposed standards with 20 standards scoring $\geq 90\%$ agreement, with the lowest agreement being 78.5% for one standard. Suggestions regarding additional standards and wording clarifications were provided. Standards were revised and sent to the identified subset of 48 people for Rounds 2 and 3. Results from Rounds 1 and 2 will be presented. **Conclusion:** Consensus on clear, measurable standards to promote healthy sleep in hospitals will support global advocacy efforts for a "sleep-friendly" accreditation system for institutions, thereby incentivising change and providing a clear framework to monitor progress.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

239 An Evidence-Based Synthesis to Understand eHealth Sleep Program Implementation Through the COM-B Model: From Barriers to Facilitators

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

eHealth interventions have emerged as effective and accessible solutions for treating sleep difficulties. Research to date demonstrates that the eHealth intervention, *Better Nights, Better Days (BNBD)*, significantly improves sleep outcomes for those who implement the intervention. However, as with other eHealth programs, implementation can be challenging. The Capability, Opportunity, and Motivation Model of Behaviour (COM-B model) provides a framework for understanding the barriers and facilitators experienced by individuals during implementation. The model can be used to inform strategies to enhance implementation by promoting facilitators and

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reducing barriers related to an individual's capability, opportunity, and motivation. This rapid review aimed to (a) identify key barriers and facilitators reported across studies by parents, healthcare providers, and sleep experts when implementing iterations of the *BNBD*, and (b) map the barriers and facilitators onto the COM-B model. Ten qualitative, quantitative, and mixed-method studies that examined barriers and facilitators to the implementation of *BNBD* were included. Program iterations included *BNBD-TD*, *BNBD-NDD*, *BNBD-COVID*, and *BNBD-OSA* and were published between 2015 and 2023. Data on study design and key findings were extracted and mapped to the subcomponents of the COM-B model independently by two researchers (MD, TM). Across the studies, more facilitators ($n = 207$) than barriers ($n = 92$) were identified. The main themes that mapped onto the subcomponents of the model were physical capability (e.g., feasible to implement), psychological capability (e.g., parental self-efficacy), physical opportunity (e.g., program design), social opportunity (e.g., support), automatic motivation (e.g., convenient), and reflective motivation (e.g., empowering for parents). The most common facilitator COM-B component was automatic motivation ($n = 108$), and the most common barrier COM-B component was psychological capability ($n = 33$). Our results have the potential to guide future program modification and implementation success of *BNBD* and can also be applied to other eHealth sleep interventions.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

241 Co-Designing Nova Sleepcare: An Innovative Sleep Education Intervention to Improve Behaviors of Concern and Sleep for Youth with Neurodevelopmental Disorders

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¹University of Calgary, Calgary, Alberta, Canada. ²Dalhousie University, Halifax, Nova Scotia, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background: Neurodevelopmental disorders (NDDs) impact up to 18% of Canadian youth, the majority of whom exhibit behaviors of concern (BoC) such as aggression and self-injury. Sleep disturbances impact many youth with NDDs and are a promising modifiable risk factor for BoC, as improving sleep can improve behavior. Sleep education is the first-line treatment of sleep disturbances, improving sleep in other pediatric populations. However, there is no avenue for expert and timely delivery of tailored sleep education for this population. Our **primary**

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objective was to co-design Nova Sleepcare in partnership with youth with NDDs who have BoC, caregivers, and physician partners – our three end-users groups – using a two-phased approach.

Methods: *Phase I:* Eight youth, nine caregivers, and six physicians participated in unstructured interviews exploring barriers and facilitators of effective in-clinic, physician-delivered sleep education. Meeting recordings were transcribed verbatim and a reflexive thematic analysis (RTA) conducted using NVivo software (V12). *Phase II:* Four youth, six caregivers, and five physicians participated in consensus discussions using nominal group technique to finalize Nova Sleepcare for feasibility and efficacy testing.

Results: Nova Sleepcare consists of handouts for youth, caregivers, and physicians, a Pathway to Better Sleep for stepwise implementation of strategies including melatonin, and a website. RTA identified the following themes: (1) end-users are motivated to learn more; (2) despite high motivation, end-users have limited bandwidth to implement strategies to improve sleep; (3) Nova Sleepcare is accessible and individualizable; (4) Nova Sleepcare facilitates stepwise sleep problem solving. To facilitate successful implementation of Nova Sleepcare, the following priority areas were identified: reviewing Nova Sleepcare pre-appointment, an app to track progress, conducting a needs assessment for physicians, and employing teaching strategies for physician training.

Conclusion: Rooted in the lived experiences of youth with NDDs and their caregivers, Nova Sleepcare is an innovative approach to the treatment of BoC.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

247 The Role of Sleep and Sociodemographic Factors in Screen Time's Impact on Socioemotional Development

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 1 - PEDIATRIC POSTERS

Abstract | Résumé

Background: Screen use among young children has risen sharply, particularly during the COVID-19 pandemic, raising concerns about its effects on socioemotional development. Sociodemographic factors, such as maternal education and racialized status, and parental mental health shape

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patterns of screen use, and may amplify its impact. Moreover, sleep plays a critical role in supporting socioemotional functioning and may be disrupted by screen time, potentially serving as a key pathway through which screen use influences socioemotional outcomes. This study investigated how weekly screen time affects socioemotional difficulties in early childhood, focusing on sleep duration as a mediating pathway and sociodemographic factors as predictors of screen use. We hypothesize that increased screen time will predict greater socioemotional difficulties, mediated by reduced sleep duration. We further hypothesize that maternal education, racialized status, and maternal depressive symptoms will predict higher screen use.

Methods: Participants ($n=3766$) are from a longitudinal pregnancy cohort recruited between April 2020 and July 2022. At 24 months postpartum, parents reported their children's weekly screen time, sleep duration, and socioemotional functioning. Maternal education, race/ethnicity, and depressive symptoms at 24 months postpartum were also assessed. Quasi-binomial probit regressions and mediation analyses were conducted.

Results: Higher screen time was significantly associated with greater socioemotional difficulties ($p < .001$). Reduced sleep duration mediated this relationship ($p < .001$), highlighting shorter sleep duration as a key mechanism linking screen time to socioemotional challenges. Children of mothers with lower education ($p = .01$), racialized parents ($p = .04$), and those experiencing elevated depressive symptoms ($p < .001$) showed greater screen use, which was linked to socioemotional risk.

Conclusion: These findings highlight that screen time intersects with sleep duration and sociodemographic factors to shape child socioemotional development. Effective interventions must integrate screen time guidelines with equitable strategies to improve child sleep and address systemic disparities.

Submission Category | Catégorie de soumission

Pediatric sleep: from infancy to adolescence | Le sommeil chez l'enfant : de la petite enfance à l'adolescence

POSTER SESSION 2

5 Se Plonger Dans Les Phénomènes Des Rêves: Les Premières Analyses De L'archive Montréalaise Des Rêves Volants

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Université de Montréal, Montréal, Québec, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Les rêves de vol sont un phénomène exaltant et intense dont les cultures font l'expérience depuis des milliers d'années. Cependant, peu de recherches permettent de comprendre les motivations, les techniques, les obstacles et les moyens d'apprendre à voler en rêve. Nous construisons une base de données en libre accès de récits de rêves de vol provenant des médias sociaux, de bases de données publiques, et de sources individuelles de rêveurs. Cette base de données, qui ne cesse de s'enrichir, comprend actuellement 7 000 rapports de plus de 4 500 rêveurs provenant de Reddit, LD4ALL, Twitter, The Sleep and Dream Database, Dreambank et d'autres blogs et forums. Nous développons également des critères de notation pour analyser le contenu de ces rêves et mieux comprendre la diversité de ces expériences. Les chercheurs et les rêveurs intéressés auront accès à ce corpus de rapports afin de mener des recherches et d'appliquer diverses techniques de rêve pour induire des rêves volants. Les résultats préliminaires comprennent des analyses des techniques de vol, des motivations, des difficultés et de la lucidité dans les rapports de rêves. En contribuant à des initiatives de science ouverte, cette base de données peut également faire progresser notre compréhension des mécanismes fondamentaux de la formation des rêves de manière plus générale.

Submission Category | Catégorie de soumission

Sleep, dreams and mental health | Sommeil, rêves et santé mentale

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

15 Sleep Restriction and Its Cognitive Consequences in Military Cadets During Winter Field Training

Mr. Xavier Michaud^{1,2}, Dr. Nicholas van den Berg^{1,3}, Dr. Chun William Yao^{1,2}, Dr. Jeroen Van Cutsem³, Dr. François Haman⁴, Dr. Antonio Martin¹, Dr. Tommi Ojanen⁵, Dr. Jani Vaara^{6,7}, Dre. Nathalie Pattyn^{2,7}, Dr. Guido Simonelli^{2,1}

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Objectives: Obtaining optimal sleep can be challenging due to occupational demands, especially for military personnel, both during and outside deployment. This study aimed to objectively assess sleep duration and simulate the impact of sleep disruption on cognitive performance during a military winter field training in a near-Arctic environment. We compared changes in total sleep time (TST) between first-year and second-year cadets before and during training and used the individual trajectories of TST and sleep-wake activity to predict expected psychomotor vigilance reaction times (RT) under sleep-restricted conditions.

Methods: This observational cohort study included 39 Finnish military cadets (mean age = 22.7 years, 10% female) divided into first-year (n = 18) and second-year (n = 21) groups. Sleep data were collected using wrist-worn actigraphy for 6 days pre-training and 13 days during training. Simulated vigilance (RT) was estimated using the 2B-Alert web tool, based on sleep-wake patterns derived from actigraphy data. Group differences in sleep duration were analyzed using a 2x2 ANOVA, while performance simulations were assessed using linear mixed-effects models and panel regression.

Results: First-year cadets exhibited a greater reduction in nighttime sleep during Winter training (30.50%) compared to second-year cadets (7.75%). Simulated RT performance revealed significant declines in first-year cadets ($p < 0.001$), whereas second-year cadets displayed more stable performance, with slight improvements among poor performers.

Conclusion: Winter military field training in near-Arctic conditions significantly impacts sleep and simulated cognitive performance, particularly among first-year cadets. The 2B-Alert tool offered valuable insights into the cognitive consequences of sleep disruption in such demanding environments.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

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19 Novel Oral Appliance O2Vent Optima Is Less Expensive Than CPAP Therapy in Canada for Mild and Moderate Obstructive Sleep Apnea

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TRS Waterloo Sleep Institute, Waterloo, ON, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction

Common perception that oral appliance therapy (OAT) is more expensive than the continuous positive airway pressure (CPAP) therapy may be a prohibitive factor for many clinicians and patients. Private insurance payers in Canada offer preferential approvals for CPAP over OAT. While oral appliance costs vary and encompass high dentistry fees, CPAP costs are standard. The purpose of this investigation is to examine the costs associated with O2Vent Optima versus the CPAP.

Methods

CPAP costs are partially offset by the OHIP, the consumables replaced as recommended by the manufacturers are paid by the users or private insurance. The replacement schedule for the consumables include: mask, hose, filters, wipes, mask replacement cushions, water reservoir, tubing and distilled water. The O2Vent Optima also has additional costs for consumables: connector bands, antibacterial tablets for cleaning and ExVent valves.

Results

Initial CPAP price is \$1,500; \$1,085 with government subsidy. Yearly expenditure for the CPAP consumables is \$1,330. Total cost for a 3- year and 5- year CPAP therapy is: \$5,075 and \$7,735 respectively. O2Vent Optima retails at \$2,500 with the insurance payment, and \$2,000 if paid out of pocket. The consumables cost \$200/year. Total cost of O2Vent Optima at 3- year and 5- year is: \$3,100 or \$2,600 and \$3,500 or \$3,000 respectively. Over a 3- and 5- year period, O2Vent Optima resulted in a net saving of \$1,975 and \$4,235 over CPAP. Daily cost burden of CPAP at 3- and 5- year is \$4.63 and \$4.24 compared to \$2.83 and \$1.92 at 3- and 5- year with O2Vent Optima.

Conclusion

Therapy with CPAP compared to OAT with O2Vent Optima costs 165% more at 3 years and 220% more at 5 years. Based on this analysis, it is anticipated that private insurance payers in Canada will endorse a cost-effective and better tolerated therapy with novel oral appliance O2Vent Optima, in addition to the CPAP.

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Submission Category | Catégorie de soumission

Dental and surgical sleep medicine | Médecine dentaire et chirurgicale du sommeil

20 Sleep Quality and Functional Outcomes with EPAP Enhanced Novel Mandibular Advancement Device (EMAD) versus Continuous Positive Airway Pressure (CPAP) in Obstructive Sleep Apnea

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TRS Waterloo Sleep Institute, Waterloo, ON, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Study Objectives: To compare self-reported sleep quality, treatment compliance, and respiratory event index (REI) after 6 months of treatment with EPAP enhanced mandibular advancement device - O2Vent Optima+ExVent (EMAD) or continuous positive airway pressure (CPAP) in mild and moderate obstructive sleep apnea (OSA).

Methods: A total of 46 patients with mild or moderate OSA were allocated to EMAD or CPAP treatment and followed for 6 months. Data were collected through Level 1 polysomnographic sleep recordings, CPAP downloads, Epworth Sleepiness Scale (ESS), Stanford Sleepiness Scale (SSS) and Functional Outcomes of Sleep Questionnaire (FOSQ-10). Data was analysed to assess compliance, ESS, SSS, FOSQ-10 scores and REI, respectively. Reliable change index (RCI) was used to evaluate change in FOSQ global score.

Results: More patients were compliant with EMAD treatment (89.5%) than CPAP treatment (48.9%) at follow-up ($P<0.001$). Both groups had improved ESS, SSS and FOSQ-10 scores: EMAD (ESS: 12.8 ± 3.6 to 7.9 ± 2.6 ; SSS: 3.4 ± 1.2 to 2.2 ± 0.7 ; FOSQ-10: 13.2 ± 2.9 to 17.3 ± 3.1 ; mean difference -2.9 , (95% CI -3.5 to -2.4); $P<0.001$) and CPAP (ESS: 13.2 ± 3.5 to 6.7 ± 3.4 , SSS: 3.3 ± 1.1 to 2.2 ± 0.9 ; FOSQ-10: 13.9 ± 2.5 to 17.8 ± 3.61 ; mean difference -3.1 (95% CI -3.2 to -2.4); $P<0.001$). More patients had improved FOSQ global score according to the RCI in the EMAD group (38.6%) than in the CPAP group (16.7%) ($P=0.01$). Both treatments reduced REI to <10 /hr. similarly; EMAD (84%) and CPAP (93%) ($P=0.08$).

Conclusions: Both EMAD and CPAP treatments improved self-reported sleep quality in patients with mild and moderate OSA. EMAD treatment was associated with better compliance and improved sleep quality than CPAP, REI was reduced similarly with both treatments. We conclude that MAD treatment should be considered a better treatment option than CPAP in mild and moderate OSA.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Keywords: continuous positive airway pressure; mandibular advancement; obstructive sleep apnea; patient compliance; O2Vent Optima

Submission Category | Catégorie de soumission

Dental and surgical sleep medicine | Médecine dentaire et chirurgicale du sommeil

27 Lucid Dream Induction as a Treatment Technique for Insomnia Symptoms: An Exploratory Study

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction. The dreams of people suffering from insomnia have a more negative emotional valence than those of good sleepers, and this aspect can influence daytime stress. Since lucid dreaming can be used to influence dream content and emotional valence, it's an avenue worth exploring. The first objective was to measure the effect of the Lucidity Induction Technique (LIT) on lucidity and emotional valence in dreams, daytime stress, and sleep quality. The second objective was to verify changes over time in sleep quality, severity of insomnia symptoms, lucidity and affect following LIT.

Method. This single-case multiple baseline study included 8 participants (6 women) aged from 21 to 40 years old ($M = 29$, $SD = 7.61$). After a 2, 3 or 4 week baseline, participants received LIT training. Participants completed daily self-report questionnaires on lucidity in dreams, positive and negative emotional valence in dreams, daytime stress, as well as a sleep and dream diary throughout the study. Participants also completed questionnaires assessing sleep quality (PSQI), severity of insomnia symptoms (ISI), lucidity (LUSK) and affect (PANAS) pre, post and 1 month follow-up. Visual analyses were performed to measure the effect of the LIT on lucidity and emotional valence in dreams, daytime stress, and sleep quality (Objective 1). Repeated measures ANOVAs were performed to assess the effect of the LIT over time in sleep quality, severity of insomnia symptoms, lucidity and affect (Objective 2).

Results. Visual analyses showed improvements between pre-treatment and post-treatment in most participants' sleep efficiency and time awake after falling asleep. ANOVAs showed a significant difference between the three measurement times for sleep quality ($F(2, 18) = 6.73$, $p = .021$) and the severity of insomnia symptoms ($F(2, 18) = 10.95$, $p = .001$).

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Conclusion. The results of the present study show that LIT could be a promising adjunct intervention to CBT-I.

Submission Category | Catégorie de soumission

Sleep, dreams and mental health | Sommeil, rêves et santé mentale

33 Resetting the Clock: Clinical Solutions for Delayed Sleep-Wake Phase Disorder in Adolescents – A Case Series

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction:

Delayed Sleep-Wake Phase Disorder (DSWPD) is the most prevalent circadian rhythm sleep-wake disorder, characterized by a significant delay in sleep onset and wake times. This misalignment between an individual's circadian rhythm and socially expected schedules often results in chronic insomnia, excessive daytime sleepiness, and impaired daily functioning. Adolescents are particularly affected due to early school start times, and there is a notable association between DSWPD and psychiatric conditions, such as depression and anxiety. Despite its prevalence and impact, DSWPD remains underdiagnosed, with current treatment guidelines focused primarily on lifestyle interventions like light exposure. This report aims to describe the diagnostic criteria, treatments, and clinical implications of DSWPD through case studies highlighting the disorder's impact on academic and athletic performance.

Methods:

The report is based on a review of the International Classification of Sleep Disorders-Third Edition, Text Revision (ICSD-3-TR) guidelines and relevant literature on DSWPD. Diagnostic criteria and recommendations from the American Academy of Sleep Medicine (AASM) were analyzed, focusing on sleep logs, actigraphy, and the dim-light melatonin onset (DLMO) test as diagnostic tools. Treatment modalities, including light therapy, melatonin administration, and chronotherapy, were evaluated, with a review of clinical case studies illustrating the practical application of these treatments. Two clinical vignettes were included to demonstrate the effects of DSWPD on functioning and response to treatment.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Results and Conclusion:

DSWPD is characterized by consistent delay in sleep-wake patterns that can be objectively measured using the DLMO test. DLMO is a reliable diagnostic tool, showing significant delays in melatonin secretion in DSWPD patients. Treatment options, such as OTC melatonin, are effective in advancing circadian rhythms and improving sleep quality. Case studies reveal that correcting DSWPD can significantly improve academic performance, mood, and overall quality of life, especially in adolescents. More research is needed to establish standardized diagnostic protocols and optimize treatment strategies for different patient groups.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

35 Maternal Sleep-Disordered Breathing in Pregnancy and Effect on Uteroplacental Blood Flow and Fetal Biometry Using Ultrasonography

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction. Maternal sleep-disordered breathing (SDB) has been shown to be associated with the delivery of small-for-gestational age (SGA) infants. Measurement of uteroplacental blood flow in mothers with SDB may provide further insights into the mechanism of this association. The objective of this study is to determine if there is an association between SDB in pregnancy and fetal biophysical growth parameters as well as uteroplacental blood flow.

Method. This was a retrospective analysis of pre-existing data from a multicentre pregnancy cohort study (n=234) with polysomnography (PSG) in the third trimester. SDB was defined by PSG with AHI ≥ 10 . Main outcome variables were fetal biophysical growth parameters in the second and third trimester and uteroplacental blood flow measured by doppler ultrasonography in the third trimester. Correlations and simple linear regression analyses were performed to examine associations. Fetal growth parameters were adjusted for gestational age using INTERGROWTH-21st project standards.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Results. 234 participants had fetal biophysical profile while 47 had doppler measurements. Participants with maternal SDB had non-significant reductions in all adjusted biophysical growth parameters (z-score) in the second and third trimester, but only reduction in biparietal diameter at term 2 was statistically significant ($\beta = -0.547$, (95% CI -1.010 to -0.131, $p = 0.01$)). Additionally, maternal SDB was non-significantly associated with higher proportions of fetuses with biophysical growth parameters < 10 percentile in both the second and third trimester. Uteroplacental blood flow was not statistically different between participants with and without maternal SDB.

Conclusions. Maternal SDB is associated with significant reduction in fetal biparietal diameter in the second trimester but not in other biophysical growth parameters. Maternal SDB was not associated with changes in uteroplacental blood flow. Future studies assessing for other metrics for SDB other than the AHI (i.e., flow limitation, oxygen desaturation indices) may be warranted to better understand these relationships.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

37 Impact of Lemborexant on Daytime Sleepiness/Alertness in Participants With Comorbid Insomnia and Mild Obstructive Sleep Apnea

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background: This post-hoc analysis assessed the impact of lemborexant (LEM), a dual orexin-receptor antagonist approved to treat insomnia in adults, on morning sleepiness/alertness in participants with comorbid insomnia and mild obstructive sleep apnea (COMISA). COMISA is associated with daytime functioning and cognitive impairments. Some sleep-promoting medications cause residual morning sleepiness, potentially exacerbating daytime impairment. Therefore, it was important to understand whether objective polysomnographic improvement of insomnia in COMISA participants treated with LEM impacted morning sleepiness.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Methods: Of the overall population (n=1006), data from a subgroup (n=410; 40.8%) of adults (≥55 years of age) with comorbid insomnia disorder (*Diagnostic and Statistical Manual*, 5th edition; Insomnia Severity Index score ≥13) and mild obstructive sleep apnea (apnea-hypopnea-index, 5 to ≤15 events/h) from Study E2006-G000-304 (NCT02783729), a 1-month, randomized, placebo- and active-controlled study, were analyzed. Participants received placebo (PBO), LEM 5mg (LEM5), LEM 10mg (LEM10), or zolpidem tartrate 6.25mg (not reported). A daily sleep diary assessed morning sleepiness/alertness rated from 1 (extremely sleepy) to 9 (extremely alert). Percentage of participants shifting from baseline mild/moderate sleepiness (≤3) towards greater alertness (4, 5, or >5) during the first and last 7 mornings of treatment was analyzed.

Results: At baseline, 17/75 (22.7%), 36/112 (32.1%), and 28/104 (26.9%) participants with COMISA receiving PBO, LEM5, or LEM10, respectively, reported mild/moderate sleepiness. Of these, across the first and last 7 mornings, a greater percentage shifted from mild/moderate sleepiness towards alertness with LEM5 (66.7%, 82.9%) and LEM10 (64.3%, 75.0%) versus PBO (47.1%, 64.7%), respectively.

Conclusion: While the sample size was too small to detect statistical differences, a greater percentage of participants with COMISA experienced improvements in morning sleepiness across the treatment period with LEM versus PBO (ie, LEM did not increase waketime sleepiness). These data align with previous findings that LEM does not affect tasks requiring morning alertness.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

41 The Impact of Sleep Disturbance on Physical Health in a Severe Asthmatic Pediatric Population

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: Children with severe asthma experience considerable daytime symptoms that impact academic performance, leading to reduced quality of life, more frequent hospitalizations, and even death. Understanding the factors behind low physical activity (PA) and promoting positive PA behaviors, will provide valuable insights that may optimize clinical outcomes.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Objective: To evaluate the sleep quality, sleep duration, daytime sleepiness, and frequency and intensity of PA in children with severe asthma compared to healthy controls.

Methods: This prospective study compares two age-sex matched groups aged 7 to 10 years: a severe asthma and healthy control group. Subjects were given the ActiGraph wGT3X-BT for 7 consecutive days and nights using a 24 hour-a-day protocol. This device objectively measures wake/sleep cycles to provide continuous, high resolution sleep quality and PA measures. The validated Epworth Sleepiness Scale (ESS) was used as a self-reported measure of daytime sleepiness and the Child Sleep Habits Questionnaire (CSHQ) a measure of sleep disturbance.

Results: A total of 90 children were recruited: 45 severe asthma and 45 age-sex matched healthy controls. The mean (\pm SD) age of those with severe asthma and healthy controls was 8.5 ± 1.2 and 8.5 ± 0.8 years, respectively with 30/45 (66.7%) male participants in both groups. No significant differences were found in total ESS daytime sleepiness scores ($p=0.11$), total CSHQ sleep disturbance scores ($p=0.08$), sleep efficiency ($p=0.22$), sleep duration ($p=0.56$), time spent in weekly light PA ($p=0.67$), and time spent in weekly moderate-to-vigorous PA ($p=0.38$) between groups. However, children with severe asthma were more sedentary compared to controls (482.8 ± 59.3 minutes vs. 442.1 ± 66.5 minutes; $p=0.051$) over the same 7 day period.

Conclusion: Children with severe asthma did not differ in daytime sleepiness and maintained similar weekly PA participation to controls. Further research in larger sample sizes is needed to better understand the impact of PA participation in children with severe asthma.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

48 Health Care Utilization and Costs of Bariatric Surgery Patients with vs. without Comorbid Obstructive Sleep Apnea in Ontario, Canada

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

Rationale:

There is mixed evidence regarding the effect of obstructive sleep apnea (OSA) on peri-operative outcomes and, in turn, the effect of OSA on healthcare utilization and costs. The objective of this study was to compare healthcare utilization and costs between bariatric surgery patients with vs. without diagnosed OSA at 30 days post-surgery.

Methods:

We conducted a population-based cohort study with propensity score matching using the Ontario Bariatric Registry from 2010 to 2016 linked to ICES databases. Costs were measured in 2018 Canadian dollars, using the perspective of the public healthcare system. We compared healthcare costs by bootstrapping the 95% confidence interval (CI) of the mean difference (5,000 resamples) and used negative binomial (NB) or zero-inflated NB regression models to compare healthcare utilization.

Results:

A total of 18,074 patients underwent bariatric surgery. Most patients had a single hospitalization in those 30 days, which consisted of the bariatric surgery admission. Hospitalization-related costs in the 30-day post-operative period were lower in those with vs. without OSA (\$9,805.56 vs. \$10,130.51, mean difference \$-324.95, 95% CI \$-93.89 to \$-559.56, per patient). There was no difference in the number of hospitalizations (median[IQR] 1 [1-1] vs. 1 [1-1], $p=0.21$) or length of stay (median[IQR] 2 [2-3] vs. 2 [2-2] days, $p=0.15$) in those with vs. without OSA.

Conclusions:

Within 30 days post-bariatric surgery, patients with diagnosed OSA had lower healthcare costs per patient compared to matched patients without OSA. Although the point estimate is small, when multiplied by the number of patients undergoing bariatric surgery, this represents a significant difference in healthcare spending. Given that there was no difference in the number of hospitalizations or length of stay per patient, we postulate that the difference in hospitalization cost was secondary to increased resource utilization intensity (i.e. tests, procedures, monitoring) in the group without diagnosed OSA.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

50 Assessing Outcome of Oral Appliance Therapy for Obstructive Sleep Apnea Using Apnea-Hypopnea Index and Sleep Apnea-Specific Hypoxic Burden

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: Apnea-hypopnea index (AHI) is a frequency-based index used to define the severity of obstructive sleep apnea (OSA). However, AHI is not predictive of OSA-related risk. Conversely, sleep apnea-specific hypoxic burden (SASHB) appears to be predictive of OSA-associated risk. The purpose of this analysis was to present a comparison of AHI and SASHB when used to define therapeutic efficacy with precision oral appliance therapy (OAT).

Methods: Data from three prospective clinical studies that investigated OAT in OSA were analyzed. Participants (n = 152) with all severities of OSA completed two-night type 3 home sleep tests before and after receiving an oral appliance (ProSomnus Sleep Technologies, Pleasanton, CA). Apnea-hypopnea index and SASHB were calculated. For SASHB, a cut-off of 60%min/h was used based on data indicating that values above this limit are associated with OSA-related risk; for AHI, a cut-off of $< 10 \text{ h}^{-1}$ was used because of its prevalence in clinical practice.

Results: OAT significantly decreased AHI and SASHB in all severity strata. Using $\text{AHI} < 10 \text{ h}^{-1}$ as the criterion for therapeutic efficacy, 81% of moderate and 57% of severe participants were efficaciously treated. When $\text{SASHB} < 60\% \text{ min/h}$ was used as the criterion of therapeutic efficacy, 100% of moderate and 85% of severe participants were treated by OAT. Agreement analysis between AHI and SASHB showed that 19% of moderate and 28% of severe participants were misclassified as therapeutic non-responders (based on AHI) when their SASHB was below the threshold of increased risk.

Conclusions: Precision OAT significantly improved SASHB. The use of AHI appears to misclassify some individuals as therapeutic non-responders to precision OAT despite their having an SASHB in the low-risk range. Sleep apnea-specific hypoxic burden likely provides a more meaningful assessment of OSA treatment efficacy than AHI as it accounts for the risk associated with the disease.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

52 The Impact of Tonic and Phasic REM Sleep and Eye Movements on Implicit Motor Memory Consolidation

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Sleep, and especially non-REM sleep, plays a crucial role in consolidating explicit motor sequence memory, particularly the spatial aspect of the memory representation. By contrast the role of sleep in supporting implicit motor sequence memory consolidation is less well understood. Some studies suggest REM sleep is involved in implicit motor sequence memory consolidation, particularly the motor aspect of the memory representation. However, the respective roles of phasic and tonic REM sleep have not been explored. This study investigated the role of rapid eye movements during phasic and tonic REM sleep in the consolidation of implicit motor sequence memory.

Thirty-six participants completed the Serial Reaction Time Task (SRTT) using their left hand, before and after overnight sleep, with a one-week follow-up. The task was adapted to dissociate the spatial and motor representations. Subsequent overnight PSG recordings were used to identify phasic (eye movement bursts) and tonic (isolated eye movements) during REM sleep. Event-related spectral perturbation (ERSP) analysis was used to detect differences in spectral power time-locked to eye movements during tonic and phasic REM sleep.

Significant improvements in the motor aspect of the memory representation were observed after one week. An increase in post-learning REM duration was also observed, and the change in the duration of tonic REM sleep correlated with post-sleep motor improvements. Notably, there was a significant increase in theta power time-locked to tonic eye movements at frontal areas (Fz) and the trained hemisphere (C4).

Tonic REM sleep, rather than phasic REM, appears to play a key role in implicit motor sequence memory consolidation, particularly for the motor aspect of the memory representation. These findings suggest that only certain aspects of implicit motor learning, specifically the motor component, are sleep-dependent, with tonic REM sleep being more critical than phasic REM sleep.

Submission Category | Catégorie de soumission

Sleep, brain plasticity and memory | Sommeil, plasticité cérébrale et mémoire

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

55 Correlations Between Sleep Quality and Sleep Parameters in Adults With Insomnia Treated With Lemborexant

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background: Patient-reported sleep quality (sQual) and sleep parameters may not always be concordant. This post hoc analysis examined correlations between sQual and subjective sleep onset latency (sSOL), total sleep time (sTST), and wake after sleep onset (sWASO) using data from two Phase 3 studies (E2006-G000-303, Study 303; E2006-G000-304, Study 304) of lemborexant (LEM), a dual orexin-receptor antagonist approved to treat adults with insomnia.

Methods: Study 304 (NCT02783729), a 1-month, multicenter, randomized, double-blind, placebo (PBO)-controlled study in older adults (≥55 years) with insomnia disorder, and Study 303 (NCT02952820), a 12-month, multicenter, randomized, double-blind, PBO-controlled (first 6 months) study in adults (≥18 years) with insomnia disorder, evaluated LEM 5 mg (LEM5) and LEM 10 mg (LEM10) versus PBO. Patient-reported sQual was rated on a 9-point scale (1=extremely poor, 9=extremely good). Ratings from 7 nights of PBO run-in and end of treatment (Study 304: 1 month; Study 303: 6 months) were analyzed. Correlations between changes from baseline (CFB) in sQual and sleep parameters (sSOL, sTST, sWASO) were analyzed with Spearman's rank correlation.

Results: Mean baseline sQual ranged from 3.7–3.9 (Study 304) and 3.8–4.0 (Study 303). All sleep variables improved with LEM compared with PBO. sQual CFB were larger (improved) and statistically significant with LEM compared with PBO at 1 month (Study 304: least squares mean [SE]; LEM5, 1.5 [0.1]; LEM10, 1.4 [0.1]; PBO, 0.9 [0.1]; LEM5 vs PBO, $P=0.0002$; LEM10 vs PBO, $P=0.0029$) and 6 months (Study 303: LEM5, 1.2 [0.1]; LEM10, 1.2 [0.1]; PBO, 0.9 [0.1]; LEM5 vs PBO, $P=0.0244$; LEM10 vs PBO, $P=0.0103$). Correlations between sQual CFB and each sleep parameter CFB were statistically significant (all $P<0.0001$) across all treatments at 1 month and 6 months.

Conclusion: In adults with insomnia, improvements in sleep onset/maintenance were supported by sleep quality improvements. Patient-reported improvements were greater with LEM than PBO.

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Submission Category | Catégorie de soumission

Insomnia | Insomnie

56 Nonclinical Studies of Abuse Potential with Dual Orexin Receptor Antagonists: Concordance with Real-World Use

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background: Approved dual orexin antagonists (DORAs; lemborexant, suvorexant, daridorexant) underwent determination of abuse potential prior to regulatory approval in the United States (US). Although nonclinical data did not indicate abuse potential for any of the DORAs in humans, these drugs were placed into Schedule 4 (CIV), the same controlled class as GABAergic hypnotics. Currently, there are >9 years of postmarketing safety data from the DORAs indicating lower abuse risks compared with other CIV hypnotics.

Methods: Adverse events with preferred terms (PTs) of drug withdrawal syndrome, drug abuse, and drug dependence were evaluated from Eisai's ongoing global postmarketing safety surveillance system for lemborexant in the United States, Canada, and Japan (Dec 20, 2019–October 7, 2024) and the FDA Adverse Event Reporting System (FAERS) from suspect cases (Jan 1, 2015–March 31, 2024). In FAERS, reports of those PTs from DORAs were compared with zolpidem and benzodiazepines approved for patients with insomnia in the US (estazolam, temazepam, triazolam) and Canada (temazepam and triazolam).

Results: Given the number of patients exposed postmarketing to lemborexant (approximately 2 billion patient-days) and the number of reports to Eisai (119) received under the 3 PTs, the reporting rate is approximately 0.06 cases/million patient-days of exposure. Of 10,884 reports for DORAs in FAERS, the percentages of reports for PTs related to drug withdrawal syndrome, drug abuse, and drug dependence were 0.05%, 0.04%, and 0.1%, respectively. Conversely, reports in FAERS for the benzodiazepines (6111 reports) were 0.7%, 12.7%, and 3.8%, respectively, and 0.9%, 9.1%, and 5.2% for zolpidem (19,466 reports), respectively.

Conclusion: These findings align with research indicating that abuse potential may be accurately predicted by the results of nonclinical studies and data from other national surveillance systems, which suggests that the DORAs do not pose meaningful abuse potential and related risks.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

57 How Sleep Difficulties of Healthcare Workers with Atypical Work Schedules Impact Work-related Socioeconomic Outcomes: A Scoping Review Protocol

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction:

Long hours, evening, and night shifts, commonly known as atypical work schedules (AWS), negatively impact the health and sleep of healthcare workers, resulting in a staggering annual cost of 71-91 billion dollars primarily due to work-related errors. However, our understanding of the sleep-related socioeconomic cost associated with AWS, the role of sleep difficulties and the pathways linking AWS to higher economic burden remains poorly understood. This study aims to explore the socioeconomic costs associated with sleep difficulties among healthcare workers with AWS.

Method:

The scoping review followed JBI methodology (registration:#osf.io/68squ). A systematic literature search was conducted across multiple databases. Included studies focused on healthcare workers and the socioeconomic costs related to sleep-wake difficulties caused by AWS, with at least one sleep or sleepiness variable. Costs were categorized as individual, patient, or institutional.

Results:

The review included 239 studies, primarily investigating night, on-call, rotating, or long shifts exceeding 8 hours. Most studies evaluated individual costs: cognitive performance (n=74 studies),

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burnout/quality of life (n=65), adverse events/errors (n=60), work performance (n=58), and driving incidents (n=47). There was less research on institutional costs such as turnovers, absenteeism, and sick leave. Economical cost estimations were infrequent. Four studies evaluated the three categories. Non-validated sleep/sleepiness questionnaires were used in 40% of studies, validated questionnaires in 41%, polysomnography and actigraphy in 7%, and sleep diary in 5%. Seven percent of studies used more than one measure.

Conclusion:

Our exploration revealed that almost no study estimated the sleep-related economic cost of AWS. Very few studies used validated sleep or sleepiness measures. Furthermore, research on specific work schedules, such as long weekly hours, remains underexplored. These results highlight the need to develop this research niche to inform public health policies and target efficient preventive/therapeutic strategies.

Submission Category | Catégorie de soumission

Sleep and occupational health and safety | Sommeil et la santé et sécurité au travail

63 Preliminary Observations on Cognitive Performance and Hypnotic Prescriptions Among Long-Term Care Residents in Ontario, Canada

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background: Hypnotic medications impact cognition, and this has several implications for residents in long-term care (LTC). We conducted a province-based cross-sectional study to characterize the use of hypnotic medications in LTC residents, compare characteristics of

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individuals on hypnotics versus not, and investigate the relationship between hypnotic use and cognitive performance.

Methods: We used provincial health administrative data (Ontario, Canada) from all LTC residents 18 to 105 years old who were administered the Resident Assessment Instrument-Minimum Data Set (RAI-MDS) between 2015 and 2020. We examined multiple covariates, including demographics, chronic conditions, pain, activities of daily living, social engagement, and cognitive performance. Three levels of hypnotic medication exposure (from greatest to least) were defined: (i) exposed in the past 1 week, (ii) exposed in the past 1 year but not within the past week, and (iii) not exposed in the past year.

Results: We included 204,309 individuals: median age: 85 years old (IQR: 78-90), 34% men. Hypnotics were used by 33% of LTC residents in the past week, 19% in the past year, and 48% did not use them within the past year. Those on hypnotic medications were more likely to have comorbid psychiatric and neurological disorders, be on opioids and use 9 or more different medications. Individuals with higher levels of hypnotic exposure were more likely to be severely impaired on the RAI-MDS cognitive performance scale (11.1% vs. 9.4% vs. 6.1%), had more short and long-term memory issues (78.3% vs. 70.3%; 59.5% vs. 48.2%), and have a dementia diagnosis (77.0% vs. 70.1% vs. 63.6%). All standardized differences were >10%.

Discussion: The prevalence of hypnotic medication use in LTC is high despite the recognition that these medications pose safety risks for the elderly and for those with cognitive impairments. Individuals exposed to hypnotic medications had higher rates of memory and cognitive impairments.

Submission Category | Cat gorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurod g nescence

71 Nap, Exercise, or Do Nothing: Finding the Best Strategy to Protect Memory After Sleep Loss

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Sleep deprivation impairs the encoding of new episodic memories, the memory of events. Since one-third of the population lacks adequate sleep, investigating strategies to cope with memory impairments caused by sleep loss is important.

We compared the effects of a 90-minute nap, 20 minutes of vigorous exercise and 20 minutes of sitting (control group) on memory performance after sleep loss. After the interventions, participants performed an episodic memory encoding task and were tested three days later. EEG during encoding was used to investigate mechanisms underlying the intervention effect. Spectral power was compared between the groups to investigate the intervention effect on brain states and subsequent memory effect (SME) was measured to compare the activity supporting effective encoding.

We found a significant intervention effect on the memory of items seen after sleep loss (hit rate) ($F(2,50) = 4.5; p = 0.016$). Post-hoc analyses revealed that despite significantly higher fatigue due to intervention in the exercise and control groups than the nap group, the exercise and nap groups showed a significantly higher hit rate than the control group and had a similar effect size (Cohen's $d > 0.86$).

Spectral analyses showed that, compared to the nap group, the exercise and control group had a greater global delta/theta power (markers of fatigue, sleep pressure and drowsiness) and beta power over parieto-occipital sensors. Surprisingly, in the exercise group, fatigue by intervention negatively correlated with the global delta power and positively correlated with SME. Parieto-occipital delta and theta power correlated positively with SME in the exercise group, suggesting engagement of compensatory mechanisms in the fatigued state. Conversely, while in the nap group, delta power negatively correlated with SME, no correlation was found in the control group.

These results suggest that while exercise and naps confer similar benefits on memory performance after sleep loss, they may rely on different underlying mechanisms.

Submission Category | Catégorie de soumission

Sleep, brain plasticity and memory | Sommeil, plasticité cérébrale et mémoire

74 Associations Between Sleep Apnea and White Matter Hyperintensities in Older Adults

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

While sleep apnea is a risk factor for dementia, the underlying mechanisms remain poorly understood. Potential contributing factors include white matter hyperintensities (WMH), usually associated with cerebral small vessel disease. However, the role of sleep apnea in the development of these lesions is controversial. This study aims at better characterizing the impact of sleep apnea on WMH using a regional approach.

A full-night ambulatory polysomnography was performed in 127 cognitively unimpaired older adults (69.3 ± 3.8 years, 62% women) enrolled in the French Age-Well clinical trial. We computed the apnea-hypopnea, apneas and oxygen desaturations indices, hypoxic burden, mean oxygen saturation, and a sleep fragmentation score. Participants also underwent T2/FLAIR MRI from which we extracted total, lobar (frontal, parietal, temporal, occipital), periventricular and deep, and corpus callosum (genu, body, and splenium) lesion volumes. Generalized linear models were used to analyze the associations between apnea measures and WMH volumes, adjusting for sex and cardiovascular risk. Mediation analyses assessed the potential mediating role of sleep apnea in the relationship between age and WMH.

Lower mean oxygen saturation, reflecting chronic hypoxia, was associated with higher lesion volumes in all regions ($p < 0.05$) except in temporal and occipital lobes. A higher apnea index was associated with higher lesions volume in the corpus callosum and its subregions ($p < 0.05$). Finally, mean oxygen saturation mediated the effect of age on WMH volume in the splenium of the corpus callosum ($p = 0.04$).

Sleep apnea is significantly associated with WMH, particularly in the corpus callosum. The apnea index and mean oxygen saturation appear to be sensitive indicators for studying the links between sleep apnea and WMH. Further analyses will assess the mediating role of cardiovascular risk in these relationships, and the specific impact of sleep apnea-related autonomic nervous system reactivity on WMH.

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Submission Category | Cat gorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurod g n rescence

75 Poor Sleep Quality among Adults Living with Type 1 Diabetes: A BETTER Registry Study

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | R sum 

Introduction: Sleep is essential for physical and mental health. Adults living with type 1 diabetes (T1D) seem at high risk for poor sleep quality, but large-scale Canadian studies on this specific population are scarce.

Objective: Identify correlates of poor sleep quality in adults living with T1D using the BETTER Registry.

Methods: Sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI). Poor sleep quality was defined as a global PSQI score >5. The variables tested for their association with poor sleep quality included: a) sociodemographic information (age, biological sex, level of education, income, ethnicity, and body mass index); b) diabetes-related ones (diabetes duration, glucose monitoring method, treatment type, and hypoglycemia awareness); c) psychological ones (fear of hypoglycemia, diabetes-related distress and stigma, depression, and social support); and d) behavioral ones (snacking before bedtime to prevent hypoglycemia, caffeine, alcohol and cannabis use, and moderate-to-vigorous physical activity [MVPA]). Correlates of poor sleep quality were identified using multivariate logistic regression analyses.

Results: A total of 1,322 adults living with T1D (mean age: 45.0 15.0 years; 66.9% female) had sleep quality data. They reported a mean score of 6.0 3.4 on the PSQI and 47.3% had poor sleep

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quality. Being female (OR=1.422; 95% CI: 1.080, 1.873), with overweight/obesity (OR=1.376; 95% CI: 1.067, 1.775), reporting greater fear of hypoglycemia (OR=1.016; 95% CI: 1.008, 1.023), having moderate-to-severe depression (OR=6.160; 95% CI: 4.250, 8.929), always snacking before bedtime to prevent hypoglycemia (OR=1.706; 95% CI: 1.124, 2.590), using cannabis (OR=1.578; 95% CI: 1.152, 2.161), and accumulating less than 150 minutes/week of MVPA (OR=1.563; 95% CI: 1.107-2.203) were significant correlates of poor sleep quality.

Conclusion: These results highlight that many Canadian adults living with T1D have poor sleep quality and suggest that their sleep quality can be influenced by various sociodemographic, psychological, and behavioral factors.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

77 The Effect of Sleep Delay on Sleep Spindles and Mood in Adolescents with Major Depressive Disorder

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction

Sleep spindle differences in adolescents with Major Depressive Disorder (MDD) remain debated, with findings typically showing reduced spindle activity. Since sleep spindles dominate NREM sleep, are involved in sleep maintenance, and a sleep delay challenge (SDC) increases NREM duration, increasing spindle density in adolescents with MDD could potentially benefit depression symptoms.

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Methods

A total of 128 adolescents (age 13 to 18 years old) were included in the study, those clinically diagnosed with MDD (N=66; 40 females) and healthy controls (N=62; 34 females). All participants were Tanner Developmental Stage 5. To be included in the MDD group, participants must have been symptomatic for depression on the Quick Inventory of Depressive Symptomatology (self-report; QIDS-SR) and the Weinberg Screening Affective Scale – Short Form (WSAS-SF). All MDD patients were medication-free for at least 2 weeks prior to the sleep study.

Participants had an adaptation and a normal sleep night, followed by a SDC night delaying sleep by 3 hours. Polysomnographic recordings were acquired on all nights. Sleep stages were scored in 30-second epochs, with spindle detection performed at F3 and P3 using EEGlab-compatible software during NREM2 sleep epochs.

A 2 (condition; normal sleep, SDC) x 2 (group; MDD, CTRL) x 2 (sex; male, female) ANOVA analyzed changes in depression scores (QIDS-SR).

Results

MDD adolescents had a decrease in the frequency of slow spindles following the SDC condition ($F(1,114)=6.67$, $p=0.011$, $\eta^2=0.055$). The SDC also resulted in an improvement in depression symptoms ($F(1,90)=4.99$, $p=0.028$) across both MDD (8% improvement) and control (8.3% improvement) groups.

Conclusions

Taken together, these findings suggest that slow sleep spindles may be a biological marker of depression and that acute SDC may help improve depression symptoms in adolescents. Surprisingly, SDC may even be beneficial in terms of mood for adolescents that do not suffer from depression.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

80 Association Between Cognition and Sensory Functions in Patients With Isolated Rapid Eye Movement Sleep Behavior Disorder

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: Isolated rapid eye movement (REM) sleep behavior disorder (iRBD) is a parasomnia characterized by abnormal behavior during REM sleep. Moreover, iRBD is considered as a major risk factor for Parkinson's disease and dementia with Lewy bodies, two neurodegenerative diseases. Preclinical markers such as impaired cognition, olfaction, and color discrimination are common in iRBD patients, but their association remains poorly understood. We aimed to determine the association between cognition and sensory functions in iRBD patients.

Methods: Participants with iRBD (n=179, 134 men, mean age 66.31±7.31, mean education 13.93±3.71) underwent polysomnography, neurological examination and neuropsychological assessment. Sensory functions were assessed using the Brief Smell Identification Test (B-SIT) for odor identification and the Farnsworth-Munsell 100-Hue Test (FM-100) for color discrimination. Spearman's correlations were performed between composite z-scores on cognitive domains (attention and executive functions; learning and memory; visuospatial abilities) and performance on sensory measures.

Results: Poorer attention and executive functions were associated with lower performance on the B-SIT (r=0.159; p=0.035) and FM-100 (r=0.280; p=0.001). Poorer learning and memory performance was associated with poorer performance on the FM-100 (r=0.240; p=0.004). In addition, poorer visuospatial abilities were associated with poorer FM-100 performance (r=0.283; p=0.009).

Conclusions: This study shows that poorer performance on cognitive tests were associated with worse performance on sensory function, especially on a color discrimination task known to require cognitive skills. Further longitudinal studies should therefore investigate the cerebral substrates underlying cognitive and sensory deficits in iRBD to better understand the neurodegenerative process in this population and its clinical implications.

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

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81 Improvements in Working Memory for Poor Sleeper Students Following a Daytime Nap

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Undergraduate students commonly experience sleep restriction and poor sleep quality. From an on-going study examining the benefits of napping for performance and well-being, we report here preliminary data on working memory (WM) following a 30-minute nap opportunity compared to a 30-minute wake condition (within-subjects, counterbalanced order) in GOOD (GS) and POOR sleeper (PS) groups. University students (mean age = 19) were categorized as GS (n=12, all female) or PS (n=7, 1 male) based on a combination of self-report and scores on the Pittsburgh Sleep Quality Index (PSQI) and Insomnia Severity Scale (ISI). Groups achieved similar amounts of sleep in the nap opportunity: Total Sleep Time (GS=19.5 min, PS=19.6 min), Sleep Efficiency (GS=63.4%, PS=63.7%), min of Stage 2 (GS=10.9, PS=11.9), min of Stage 3 (GS=5.1, PS=4.4). A Group (good, poor) by Condition (nap, wake) ANOVA for Percent Accuracy on the 2-back WM task revealed a significant interaction ($p=.025$). Poor sleepers had significantly lower accuracy on the WM task (67%) compared to GS (86%) following the wake, but not the nap condition (PS=77% and GS=84%). WM performance in poor sleepers improved by 10% after their nap compared to their wake session, reaching levels near the good sleepers. Additionally, there was a correlation between the amount of improvement in WM following a nap compared to wake and PSQI ($r=.543$, $p=.016$) and ISI ($r=.531$, $p=.019$), such that the poorer sleepers had the most benefit in WM from the nap. In conclusion, a single brief daytime eliminated deficits in cognitive performance in poor sleeper students, providing support for napping as a practical intervention in the student population. While napping is not recommended for patients with insomnia, short naps should be explored further as a way to improve their waking function.

Submission Category | Catégorie de soumission

Sleep, brain plasticity and memory | Sommeil, plasticité cérébrale et mémoire

82 Tirzepatide Improved Sleep Disordered Breathing in Adults With Obstructive Sleep Apnea With Obesity: Results From SURMOUNT-OSA Trials.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: To investigate efficacy and safety of tirzepatide in treating moderate-to-severe obstructive sleep apnea (OSA) in adults with obesity.

Methodology: SURMOUNT-OSA (NCT05412004) is a master protocol guiding 2 randomized, placebo-controlled trials investigating the efficacy and safety of tirzepatide to placebo in adults living with moderate-to-severe OSA with obesity. Under a master protocol, the two trials were composed of trial 1: included participants who were unable or unwilling to use positive airway pressure (PAP) therapy, and trial 2: included participants who were and planned to stay on PAP therapy during the 52 week duration of the trials.

Overall, in the two trials 469 participants were randomized in a 1:1 ratio to receive tirzepatide maximum tolerated dose (MTD) 10 or 15 mg once weekly, or placebo.

Results: At baseline, mean apnea-hypopnea index (AHI) was 50.1 events/hour and mean body mass index was 38.8 kg/m². Tirzepatide-treatment was associated with mean AHI reductions from baseline to week 52 of 27.4 (55.0%) and 30.4 (62.8%) events per hour compared to 4.8 (5.0%) and 6.0 (6.4%) events per hour for placebo in trial 1 and trial 2, respectively.

Moreover, tirzepatide-treatment was associated with to a mean body weight reduction from baseline of 18.1% and 20.1%, compared to 1.3% and 2.3% for placebo, in trial 1 and trial 2, respectively.

The overall safety profile of tirzepatide in SURMOUNT-OSA studies was similar to previously reported SURMOUNT trials. The most commonly reported adverse events in SURMOUNT-OSA trials were gastrointestinal-related and generally mild to moderate in severity and occurred during dose escalation.

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Conclusion: Tirzepatide-treatment occurred with clinically meaningfully improved sleep disordered breathing compared to placebo in adults with moderate-to-severe OSA with obesity, with consistent findings across the two trials.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

86 Effectiveness and Safety of Low-Sodium Oxybate in Participants With Narcolepsy: Top-line Results From the Phase 4 DUET Study

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: Jazz DUET (**D**evelop hypersomnia **U**nderstanding by **E**valuating low-sodium oxybate **T**reatment) is a phase 4, prospective, multicenter, single-arm, open-label study (NCT05875974) evaluating the effectiveness of low-sodium oxybate (LXB; Xywav®) on excessive daytime sleepiness (EDS), and sleep structure and disruption, based on polysomnography (PSG), in participants with narcolepsy or idiopathic hypersomnia.

Methods: DUET comprised a screening period (with 2-week washout for current oxybate users), 8-day baseline (BL) period, 2- to 8-week LXB titration period, 2-week stable-dose period (SDP), 8-day end-of-treatment period (EOT), and 2-week safety follow-up. The primary endpoint was change in Epworth Sleepiness Scale (ESS) score from BL to EOT. Key secondary endpoints for the narcolepsy cohort included 3 PSG parameters: change in total shifts from deeper to lighter stages of sleep, N3 sleep duration (minutes), and number of awakenings.

Results: Fifty-five narcolepsy participants enrolled. Most were female (73%) and White (80%), and not Hispanic/Latino (95%). Mean (SD) age was 33.4 (12.9) years. Thirteen participants were taking oxybate at study entry before washout. During SDP (N=36), mean (SD) total nightly LXB dose was 7.0 (1.6) grams. BL mean (SD) ESS score was 16.3 (3.1); least-squares mean (LSM) (SE) change from BL to EOT was -7.7 (0.9), $P<0.0001$ (N=34). Compared to BL, sleep structure at EOT was more consolidated, evidenced by fewer deeper to lighter stage shifts (LSM [SE]: -13.1 [2.9]; mean [SD]:

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54.6 [28.0] to 41.6 [26.0], $P < 0.0001$), increased N3 sleep duration in minutes (LSM [SE]: 45.0 [8.8]; mean [SD]: 61.1 [34.8] to 106.1 [69.5], $P < 0.0001$), and fewer number of awakenings (LSM [SE]: -3.2 [0.9]; mean [SD]: 13.9 [9.1] to 10.8 [-7.0], $P = 0.0015$), respectively (N=34 each). Common treatment-emergent adverse events included nausea, dizziness, and headache.

Conclusions: Participants with narcolepsy taking open-label LXB showed improvements in subjective sleepiness (EDS) that paralleled improvements in sleep structure and disruption.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

92 Daylight Saving Time and Acute Myocardial Infarction in Canada: The DST-AMI Study

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Literature suggests an increased risk of acute myocardial infarctions (AMI) following daylight saving time (DST) transitions. We investigated this issue in a Canadian population.

We retrospectively studied a cohort of 1058 patients aged ≥ 18 years (mean: 65 ± 12 years) admitted to a large general hospital in Montréal with a diagnosis of AMI, from February 2016 to December 2022. The DST transition period was defined as two weeks following DST while control periods were two weeks before and two weeks after the transition period. There were 362 patients in the transition group and 696 in the control group. Baseline clinical characteristics were comparable between both groups. The incidence rate ratio (IRR) of AMI and infarct size by biomarkers were calculated before, during and following DST transitions. We compared the pre-COVID-19 period (2016-2019) to the actual COVID-19 period (2020-2022).

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In the pre-COVID period (611 patients), the AMI per day IRR was higher in the DST transition group than the control group (2.04 vs 1.71; IRR=1.19, 95% CI 1.01 – 1.41, p=0.041). During the actual COVID period, the size of AMI that was larger after than during the transition period (creatinine phosphokinase-MB 137 ± 229 µg/L vs 93 ± 142 µg/L; p=0.013).

When pre- and pan-COVID periods were collapsed, the rate of AMI per day following DST transitions was 1.85 compared to 1.78 during control periods. DST transition was not associated with an increase in AMI (IRR=1.04, 95% CI 0.91 – 1.18, p=0.56) nor with infarct size.

An increased risk of AMI upon DST transition was confirmed in the pre-COVID period, but not during the actual COVID pandemic. Further analyses controlling for season of transition (spring and fall), type of MI (ST-elevation or not), gender and day of the week were performed to decipher supplementary contributing factors.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

93 The Impact of Hypnosis on Sleepwalking Episodes: Results From a 6-Month Follow-Up

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction

There are currently no properly powered, prospective trials for the treatment of sleepwalking. Among non-pharmacological treatments, the most recommended is hypnosis. However, reports are limited and contain vague or nonexistent descriptions of hypnosis treatment protocols and much of the data is descriptive and retrospective in nature. The aim of the present study was to conduct a prospective and long-term investigation of sleepwalking frequency in adult sleepwalkers before and after a standardized hypnosis treatment protocol

Methods

Twenty-one adults (6 men, 15 women) with a mean age of 35 years and an ICSD-based diagnosis of

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sleepwalking first underwent overnight polysomnography to rule out the presence of other major sleep disorders. Participants then completed a clinical investigation of their sleepwalking episode frequency and behaviours. Four weeks later, participants entered a hypnosis-based treatment protocol consisting of four 45-minute hypnosis sessions. Six months after the final treatment session, participants completed the same clinical investigation as at baseline

Results

When compared to sleepwalkers' baseline frequency values, 6-month post treatment assessment revealed a significant reduction in episode frequency (3.8 ± 2.6 vs 1.6 ± 2.1 episodes per week). In addition, participants further reported a significant reduction in the occurrence of more complex somnambulistic behaviors

Conclusions

Our results indicate that the hypnosis-based treatment protocol used in the present study resulted in a marked reduction in the frequency sleepwalking episodes 6 months post-treatment, including positive impacts on more severe and potentially generous episodes. The next steps in this research include collecting longer term follow-up data and the investigation of mechanisms through which hypnosis may exert its therapeutic effects.

Acknowledgements

This research was supported by the Canadian Institutes of Health Research (grant # MOP 49515) to AZ and JM.

Submission Category | Catégorie de soumission

Parasomnias | Parasomnies

95 A Qualitative Study of Patient Perspectives on Wait Times for Obstructive Sleep Apnoea Care

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background: Obstructive sleep apnea (OSA) is a prevalent chronic condition associated with significant health consequences if left untreated. Delayed OSA care may lead to adverse clinical outcomes, but the direct effect on patients' experiences with OSA care have not been explored.

Objectives: To explore patient perspectives on OSA wait times and the impact of wait times on patient well-being, motivation and engagement with care.

Methods: Participants were recruited from a randomized trial of an early care strategy (clinic visit one month after referral) versus usual care (clinic visit six months after referral). After completing their initial clinic visit, participants were recruited to participate in a 30-minute semi-structured online interview. Domains of inquiry included perspectives on wait times for OSA care, impact of wait times on well-being, motivation and confidence to use OSA treatment, and recommendations for improving OSA care delivery. Interviews were transcribed verbatim and analyzed thematically using NVivo software. Qualitative description methodology was employed to summarize data, staying close to participants' perspectives without heavy theorization.

Results: We conducted 12 interviews (5 female) with adequate representation from both study arms (4 and 8 participants from early and usual care strategy, respectively). Median (IQR) age was 54.5 (15) years. Five themes were generated from interview data: (1) timely care is compassionate care, (2) lack of transparency and communication regarding patient care, (3) feeling abandoned by the system (4) rationalizing delayed care and self-deprioritization, (5) digitization of health – a solution-based approach to wait times. All five themes were interconnected and presented in a sequence that reflected the views shared by participants. Participants from both groups shared similar perspectives on wait times.

Conclusion: Delays for OSA care have meaningful impacts on patient experiences. Understanding patient perspectives can support the development of strategies to reduce or mitigate the effects of wait times for OSA care.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

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96 Investigating Measurement Properties of the Sleep Difficulty Score From the Athlete Sleep Screening Questionnaire Among Competitive Athletes in a Community-Based Practice Setting.

Dr. Sayyid Hassan

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background:

Sleep is essential for athletes' physical and mental health, given their unique demands and injury risks. Identifying and addressing sleep issues can influence performance and overall well-being. The Athlete Sleep Screening Questionnaire (ASSQ) assesses athlete's sleep, but its properties have been validated only among national-level athletes, leaving uncertainty about its broader applicability. Therefore, this study aims to investigate the internal consistency and construct validity of the Sleep Difficulty Score (SDS) from the ASSQ among competitive athletes in a community-based practice setting.

Methods:

This observational study uses secondary data from community-based athletes recruited by sport chiropractors across 20 Canadian clinical sites in 2021. Eligible participants were 18+ competitive athletes, [\[AL1\]](#) received chiropractic care from one of the 20 sites, and able to complete an online English survey. The ASSQ, adapted from other screening tools, includes 16 items, five of which form the SDS (range 0-17). These items evaluate sleep duration, satisfaction, time to fall asleep, trouble staying asleep, and medication use before sleep. Descriptive statistics will characterize the sample. Cronbach's alpha will be used to quantify internal consistency. For construct validity, the ASSQ-SDS distributions between those with and without self-reported sleep-impairing pain will be compared using boxplots, means, and t-test.

Results:

There are 109 observations, with 82 experiencing sleep-interfering pain and 27 without. Full results will be shared after the study. Cronbach's alpha ≥ 0.7 will be considered indicative of adequate internal consistency. We hypothesized that if the SDS is a valid measure of sleep difficulty in this population, athletes with sleep-impairing pain will have a greater SDS.

Conclusion:

This is the first study to examine the measurement properties of the ASSQ-SDS in community-based competitive athletes, helping to extend the tool's generalizability beyond national-level

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athletes. This enables clinicians, athletes, and team staff to better assess sleep problems and implement early interventions.

Submission Category | Catégoire de soumission

Sleep health | Santé du sommeil

97 At-Home Sleep EEG and Visuospatial Working Memory in Older Adults with Insomnia and Subjective Cognitive Decline

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: Mixed reports on insomnia's impact on memory, specifically working memory (WM), with age require further studies. However, the gold-standard of sleep measurement, polysomnography, is not representative of habitual sleep, especially for people who have trouble sleeping, like insomnia. A fabric-electroencephalogram (EEG)-headband, such as Muse-S, can be used for sleep measurements at-home, with relatively high accuracy compared to polysomnography. Therefore, we used Muse-S (generation-2) at home in older adults with insomnia with- or without-subjective cognitive decline (SCD) to assess: 1) how sleep and visuospatial-WM differ between SCD-groups, and 2) how prior-night's sleep relates to visuospatial-WM in each group.

Methods: We recorded at-home sleep EEG and visuospatial-WM of 20 older adults with insomnia with- or without-SCD ($M[SD]=72[5.03]$ yr; 2 males; 8 with-SCD) everyday for 7-10 days. Every morning, participants completed a spatial span task on a smartphone to measure visuospatial-WM. Visuospatial-WM performance was quantified by levels completed, accuracy, and differences from the previous day ("daily change"). SCD-group comparisons were done using t-tests, and relationships between sleep and visuospatial-WM were assessed using Pearson's r and Spearman's rank correlations.

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Results: There were no significant visuospatial-WM differences between SCD-groups nor correlations between visuospatial-WM and sleep in older adults with-SCD. Subjects without-SCD had more N1 ($t=-2.490$, $p=0.020$), less N3 ($t=2.020$, $p=0.050$) and smaller deeper-to-lighter sleep stage-switch ($t=2.910$, $p=0.010$) and -fragmentation indices ($t=4.150$, $p<0.001$) than those with-SCD. Total sleep time (TST) negatively correlated with daily change in Spatial Span accuracy across groups ($r=-0.289$, $p=0.029$). In subjects without-SCD, N3 ($r=-0.331$, $p=0.039$) and TST ($r=-0.391$, $p=0.015$) negatively correlated with Spatial Span accuracy and only N3 with daily change in accuracy ($r=-0.427$, $p=0.008$).

Conclusion: Our results suggest that visuospatial-WM performance in older adults with insomnia is affected by sleep duration and deep sleep, but only in those without-SCD. Future studies on larger samples are needed to confirm these findings.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

98 Understanding How Experiences of Shiftwork During Final Preceptorship Practicums Influence Sleep Health in Women Nursing Students: A Mixed Methods Research Proposal

Niki Soroush-Asghari¹, Dr. Kathy Rush¹, Dr. Lyndia Wu², Dr. Christine Ou³, Carla Ferreira⁴, Dr. Catherine Ringham⁵, Dr. Amy Beck⁵, Jacqueline Denison¹, Dr. Elizabeth Keys¹

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Research with experienced nurses demonstrates that shiftwork and associated irregular sleeping schedules contribute to poor sleep quality and health outcomes. The nursing profession is predominately comprised of women, who are at higher risk of poor sleep quality compared to men. These factors play a role in nurse burnout. Considering the high burnout rates of Canadian new graduate nurses, there is minimal research on the sleep experiences of Canadian nursing students in their final preceptorship practicum as they start to experience shiftwork, and how it influences their desire to stay in the profession. To address this gap, we propose using an explanatory mixed-methods study with an emphasis on the qualitative portion to answer: "How do experiences of shiftwork during final preceptorship practicums influence sleep health in women nursing

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students?” In February 2025, we will recruit 20 undergraduate nursing students who identify as women and complete full-time rotating shiftwork during their preceptorship practicum in British Columbia. Data collection will be completed by June 2025. Individuals diagnosed with a sleep disorder or experiencing severe mental health distress (i.e., major depressive disorder) will be excluded. Participants’ sleep will be first be quantitatively tracked for a ten-day period using the Muse EEG headband. Then, participant’s experiences of shiftwork and perceptions of sleep will be explored through semi-structured interviews. In the second part of the interviews, summarized quantitative sleep data will be shared and participants will be invited to reflect on how shiftwork influences their sleep quality, wellbeing, and how gendered expectations influence sleep health. Quantitative and qualitative data will be narratively synthesized to examine how participants’ experiences of shiftwork can explain and contextualize the objective sleep measures. This study will inform the creation of better sleep supports for nursing students as a strategy to improve the wellbeing and retention of new nurses.

Submission Category | Cat gorie de soumission

Sleep and occupational health and safety | Sommeil et la sant  et s curit  au travail

99 Sleep Health of Children and Youth in Foster and Kinship Care: A Systematic Review

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¹University of British Columbia Okanagan, Kelowna, British Columbia, Canada. ²McGill University, Montreal, Quebec, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | R sum 

Children are often placed in foster (i.e., child is cared for by a non-relative) and kinship (i.e., child is cared for by a relative) care due to maltreatment concerns (e.g., abuse, neglect) in their family of origin. There is a robust association between childhood maltreatment and sleep (e.g., nightmares, sleep quality) behaviors, but previous reviews have not focused on children in foster and kinship care. Given high rates of maltreatment concerns and that foster and kinship placements have the potential to affect sleep, a systematic review is needed on children’s sleep health in foster and kinship care. Therefore, we are conducting a systematic review to synthesize knowledge on the sleep health characteristics of children and youth (aged 0-18 years) in foster and kinship care. We utilized the Joanna Briggs Institute methodology for systematic reviews of prevalence and incidence and conducted a comprehensive search of seven electronic databases in April 2024 with three main concepts: children, sleep, and foster or kinship care. Titles and abstracts were independently screened (JK and KRA/JL) with > 90% inter-rater reliability obtained. Twenty-one publications met the review criteria. Preliminary findings indicate that most research has occurred

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in the United States (k = 13 articles). Most articles (k = 11) focused exclusively on children/youth in foster care and only two focused exclusively on children/youth in kinship care. We observed heterogeneity in sleep health outcomes (e.g., aspects of sleep health, measures used). Although parasomnias are not typically included in sleep health measures, parasomnias were frequently measured and reported; for example, nightmares and night terrors were included in six studies and enuresis/bedwetting was examined in seven studies. Preliminary findings indicate that children in foster and kinship care may experience sleep health inequities; we will complete the final synthesis of the findings in January of 2025.

Submission Category | Catégorie de soumission

Sleep equity | Équité face au sommeil

100 Social Representations of Sleep Among Migrants and Natives in Rural and Urban Areas of the Province of Quebec

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction. Though rarely studied, social representations of sleep (SRS) are essential for understanding how sleep habits and routines are shaped within a population. SRS encompasses various cognitive elements, that can influence individual sleep patterns and rhythms.

Objective. The present research investigates the SRS in the adult population of Quebec living in rural or urban settings and migrating from one to the other during the COVID-19 pandemic. The present study further explores the preliminary findings of this study on SRS among adults living in Quebec.

Method. 95 participants (M.age = 33.9 y.o.; SD = 13; 76% women) took part in a comparative study, employing a convergent parallel mixed-methods design. Quantitative data were gathered through the *Pittsburgh Sleep Quality Index (PSQI)*, the *Internal Acculturation Index (IAI)*, and a sleep diary. Additionally, 66 out of the 95 participants completed a semi-structured interview addressing topics such as the meaning of sleep, sleep routines, living environments, and the impact of COVID-19. Qualitative data were recorded, transcribed, and analyzed thematically, while quantitative data were analyzed using Student's t-tests.

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Résultats: No significant differences were observed in PSQI, IAI, or sleep diary scores between participants residing in rural versus urban areas. The in-depth qualitative analysis revealed that participants generally reported satisfaction with their sleep, often attributing it to their choice of living in either environment. Almost all participants shared similar preconceived notions about sleep environments: urban areas were perceived as having more noise and light pollution at night, while rural areas were seen as quieter and darker at night. Often an inconsistency between the participants' preconceptions and their sleep satisfaction was observed.

Conclusion. Preconceived notions about sleep in different environments have no relation to, nor do they influence participants' sleep satisfaction. People make sense of their sleep satisfaction by choosing their living environment, although this can contradict their preconceptions about the living habitat.

Submission Category | Catégorie de soumission

Social and cultural aspects of sleep | Aspects sociaux et culturels du sommeil

101 The Impact of Night Shifts on Sleep Quality in the Hospital-Based Nursing Population: An Updated Systematic Review and Meta-Analysis.

Niki Soroush-Asghari, Dr. Charlene Ronquillo, Dr. Jelena Komanchuk, Mahtab Matin, Dr. Elizabeth Keys

University of British Columbia, Kelowna, BC, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Previous meta-analyses demonstrated that shiftwork negatively impacts sleep quality and contributes to the high attrition rate in nurses. The COVID-19 pandemic had significant impacts on nurse burnout and sleep health. Since last meta-analysis examining nurses' sleep quality was published pre-pandemic using studies up to 2018, more research has been published about nurses' sleep. Therefore, we conducted an updated systematic review and meta-analysis to answer: What is the impact of shiftwork on sleep quality in the nursing population since 2018? In August 2023, an initial search was done using Medline and CINAHL databases using synonymous terms for "nurse", "sleep quality", and "shiftwork", limited to publication date. The search yielded 282 results after removed duplicates. After title/abstract screening for inclusion criteria, 63 published, primary research articles were reviewed, and 16 articles were included. Information on nurses' sleep quality (i.e, latency, efficiency, duration), total scores of sleep quality questionnaires (i.e, Pittsburgh Sleep Quality Index), data on sex and gender, as well as factors that influence sleep quality, were extracted. Most studies were cross-sectional (n=11). Night shifts were consistently related to poor sleep quality measured by both self-reported (n=16) and objective measures (i.e.,

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actigraphy; n=3). Sex and gender have been conflated in several (n=3) studies (i.e., using the terms sex and gender interchangeably). Still, several studies found that women nurses have worse sleep quality than men nurses due to societally constructed roles (i.e., balancing traditional home demands with work). Approximately 44% (n=7) of papers reported that duration of night shifts contributes to poor sleep quality. In addition, caffeine (n = 4) and minimal exercise (n=5) may reduce sleep quality. Final meta-analyses will be completed by February 2025 using an updated search. Future research should include longitudinal studies and a precise differentiation between sex and gender to better support the sleep health of nurses.

Submission Category | Catégorie de soumission

Sleep and occupational health and safety | Sommeil et la santé et sécurité au travail

102 Association Between Conditional Probabilities of Experiencing One, Two, or Three Consecutive Poor Nights of Sleep and Sleepiness in Individuals with Insomnia Disorder

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction. Insomnia is characterized by dissatisfaction with sleep quantity or quality. Although sleepiness is not recognized as resulting from insomnia, some individuals report experiencing it. Several studies suggest that self-reported sleepiness is lower in people with insomnia disorder compared to control groups. Insomnia is also known to present extensive night-to-night sleep variability, which makes it difficult to identify or predict sleep patterns. The few studies that have investigated the association between sleep patterns in insomnia and sleepiness found no significant relations.

Objective. Assess the likelihood of a poor night after one, two, or three consecutive poor nights linked to self-reported sleepiness in individuals with insomnia.

Method. Thirty adults with insomnia disorder (M = 39.33 years old, SD = 10.95) completed an online sleep diary for 21 consecutive nights. Sleepiness before bedtime, upon waking, before and after work was assessed with the Stanford Sleepiness Scale included in the sleep diary. Conditional probabilities of observing one, two, or three consecutive poor nights were computed for each participant. Pearson correlative tests were conducted to verify the association between the

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conditional probabilities of observing a poor night after one, two, or three consecutive poor nights and the level of sleepiness.

Results. Sleepiness before bedtime was positively correlated with the probability of observing one ($r = .458$, $p = .011$), two ($r = .364$, $p = .048$), or three ($r = .420$, $p = .021$) consecutive poor nights. No associations were found between the conditional probability of observing consecutive poor nights and the level of sleepiness upon waking, before, or after work.

Conclusion. Contrary to previous findings, individuals with insomnia disorder reported more sleepiness before bedtime as the probability of having a poor night after one, two, or three consecutive poor nights increases. These results suggest that people with insomnia disorder might experience sleepiness before bedtime.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

103 Phase-Amplitude Coupling of Theta and Gamma Rhythms During Rapid Eye Movement Sleep Relating to Memory Between Younger and Older Adults

Mr. Samuel O.B. Gillman^{1,2,3}, Dr. Oren M. Weiner^{1,2,4}, Ms. Shahla Bakian Dogaheh^{1,2}, Dr. Nathan Cross^{1,3}, Ms. Michelle Ly^{1,2,4}, Ms. Sara Bekadour^{1,5}, Ms. Camille Landry^{1,3,5}, Ms. Wafa Shahid^{1,2}, Dr. Thien Thanh Dang-Vu^{1,2,3,4,5}

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Phase-amplitude coupling (PAC) between-brain oscillations may be an underlying neural mechanism of memory consolidation. Wake theta-gamma-PAC (TGC) correlates with better encoding and recall but becomes less temporally precise with age and memory decline. However, it is unclear how rapid-eye-movement sleep TGC (REM-TGC) relates to memory or age. We assessed whether REM-TGC changes with age, and relates to sleep-dependent memory consolidation.

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21 younger ($M[SD]=24.24[2.96]$ years; 13 female) and 21 older adults ($M[SD]=67.43[6.38]$ years; 13 female) underwent baseline-polysomnography (PSG) followed by two non-consecutive experimental-overnight-PSGs. Experimental-PSGs included either a word-pair-association declarative memory task (score/40) or non-memory-control task administered pre- and post-sleep, counterbalanced between-nights. Theta(5-7Hz), slower-gamma(30-64.75Hz), and faster-gamma(65-100Hz) were extracted from filtered-electroencephalography on channels Fz, Cz, Pz, T3 and T4 during experimental-PSGs. Associations between 1) REM-TGC-strength, measured by a modulation index (MI), and memory consolidation and 2) REM-TGC-phase (CP) and memory consolidation were quantified using hierarchical-multiple-linear regression and Benjamini-Hochberg-adjusted circular-linear correlations, respectively. Age-group and experimental-PSG comparisons were done using ANCOVA for MI and Watson- U^2 for CP.

Memory consolidation was greater in younger ($M[SD]=37.00[2.85]$), than older adults ($M[SD]=30.06[6.66]$) ($p<0.001$). MI was not different between-groups or experimental-PSGs, nor related to memory consolidation. CP was not different between-groups, but it was different between-experimental-PSGs, where memory task-PSG slower-gamma-CP in Cz is more precise and Pz is less precise and Fz is more precise in older but less precise in younger adults. In older adults, slower-gamma-CP positively correlated with memory consolidation in Fz ($R^2=0.225, p=0.016$), Pz ($R^2=0.304, p=0.003$), and T4 ($R^2=0.409, p<0.001$), and faster-gamma-CP in Cz ($R^2=0.188, p=0.033$) and Pz ($R^2=0.206, p=0.023$). In older adults, from anterior(Fz)-to-central(Cz)-to-posterior(Pz) slower-gamma-CP approached, reached then passed the theta peak.

Our results suggest REM-TGC strength and CP are stable between age-groups, but slower-gamma-CP may represent a memory-protecting function with age.

Submission Category | Catégorie de soumission

Sleep, brain plasticity and memory | Sommeil, plasticité cérébrale et mémoire

109 Rest for the Best: Effects of a Single Night of Sleep Extension on Fatigue in Youth Elite Hockey Players.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: Student-athletes are exposed to high level of cognitive and physical load when competing at the elite level. Sleep is essential for recovery and decreasing fatigue accumulation, but there is limited evidence evaluating interventions such as acute sleep extension to optimize performance. We evaluated the effect of one night of sleep extension on fatigue, performance and fatigability in youth elite athletes.

Methods: Twenty-two elite youth hockey players (17±1y; 1.83±0.07m; 82±7kg) of the Remparts de Québec performed study tasks on two consecutive days of 2h-hockey training followed by a 30-min Color-Multi-Source-Interference Task (cMSIT). A battery of test consisting of 3-counter movement jumps (CMJ), 3 handgrip contractions per hand, and a 3-min psychomotor-vigilance task (PVT) were performed before and after the training, and after the cMSIT. At the end of the first day, participants were randomized into sleep extension (SE) or normal sleep (N) condition. The sleep extension group was asked to respect a personalized bedtime schedule allowing them to obtain a 10h of sleep opportunity. The experimental procedures were repeated the following week inverting the group conditions, in a crossover design.

Results: More sleep was obtained for SE (7:04±0:39h) compared to N (8:11±0:47h; p<0.001). No condition effect was observed in performance at the cMSIT (response time=0.84±0.90ms; p=0.9, accuracy=96±3%; p=0.49), CMJ performance (0.45±0.05m; p=0.86), and handgrip (63±7kg; p=0.36). Fatigue showed a condition × day interaction. PVT reaction time did not change across conditions (267±22ms; p=0.37). Athletes scores for fatigue were lower after SE compared to the previous day (4.7±1.2AU to 3.6±1.1AU; p<0.001) but not after N (4.3±1.1AU to 4±1.1AU; p=0.55).

Conclusions: Modifying bedtime schedule was an effective strategy to increase sleep time in our sample. Despite no effect of sleep extension on physical or cognitive fatigability, perception of fatigue was generally lower following sleep extension.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

110 Sleep and Mental Health in Firefighters: What Are the Occupational Hazards ?

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: Firefighters working 24-hour shifts face higher risks of sleep disorders, along with reduced sleep duration and quality. However, the impact of sleep difficulties on their mental health is not well-documented. This study examines how atypical work schedules affect sleep, mental health, and alertness in Quebec firefighters.

Methods: Forty firefighters (m.age=38.85 years; SD=7.82) on either “24h” or “10/14” schedule were recruited in the province of Quebec. The 24h schedule includes seven 24-hour shifts on a 28-days cycle, while the “10/14” schedule comprises six day shifts, six night shifts, and one 24-hour shift. Participants completed sleep and mental health questionnaires, a 14-day sleep diary, and vigilance tests (PVT) after three shifts. Multiple t-tests compared the schedules (24h and 10/14) on sleep measures and generalized estimating equations examined the effects of shift types (day, night, 24-hour and days off) on sleep diary and PVT results.

Results: Regardless of schedules, participants reported high rates of mild to moderate insomnia and poor sleep quality, with symptoms of moderate-to-severe depression and anxiety (13% and 15%, respectively), post-traumatic stress disorder (10%), and psychological distress (23%). No significant differences were found between groups in sleep or mental health outcomes. Sleep duration was significantly shorter during 24-hour shifts (5.25 hours) and night shifts (5.6 hours) than on day shifts (6.5 hours; $p < 0.01$) and days off (7 hours; $p < 0.01$). Wake after sleep onset was significantly longer during 24-hour shifts, than on day shifts and days off (82 vs. 56 vs. 50 minutes; $ps < 0.01$). Response times on PVT were significantly longer after night shifts compared to day shifts (637 vs. 607 milliseconds; $p < 0.01$).

Conclusions: Firefighters report significant insomnia and various mental health symptoms, with nearly a quarter experiencing psychological distress. Reduced sleep during 24-hour and night shifts, along with extended wakefulness during 24-hour shifts, may contribute to longer response times.

Submission Category | Catégorie de soumission

Sleep and occupational health and safety | Sommeil et la santé et sécurité au travail

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

111 Determinants of Sleep and Morning Alertness in Elite Short-Track Speed Skaters During the Pre-Season.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: Sports requiring repeated intense and prolonged efforts like speed skating could present a high risk of accumulating sleep debt influencing athletes' performance and health. However, longitudinal real-world data capturing the multitude of factors influencing sleep on elite athletes remain scarce. We aimed to determine the factors that predict sleep quantity, quality and morning alertness in elite speed skaters of the Canadian Short Track team.

Methods: In the beginning of the pre-season period, sixteen athletes (7 women) compiled the Sleep Health Index, the Insomnia Severity Index questionnaire and the Caen Chronotype Questionnaire. For 14 consecutive days, athletes filled detailed logs, performed morning psychomotor vigilance tasks (PVT) and wore an actigraphic device.

Results: Athletes overestimated their sleep by only $9:42 \pm 21:34$ mm:ss, sleeping on average $07:56 \pm 00:59$ hh:mm. Mean PVT reaction time was 275 ± 34.5 ms. Sex, chronotype, and training duration explained 31.2% of the variance in sleep ($p < 0.001$), while sleep quality was mainly predicted by a combination of sex, sleep, sleep credit, screen time and chronotype (AIC = 124.53). PVT reaction time was mainly explained by sex ($R^2 = 0.509$; $p < 0.001$).

Conclusions: These preliminary results provide insights into factors influencing sleep in speed skaters, such as chronotype, training load, and sex differences. Contrary to common assumptions, evening chronotypes were associated with longer sleep duration, while men possibly experiencing faster recovery.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

112 Acceptability of At-Home Sleep Technology in Older Adults with Chronic Insomnia With and Without Subjective Cognitive Decline

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Context. As technology integrates into daily life, it is essential to address the barriers that prevent older adults from fully benefiting from digital tools.

Aim. Assessing facilitators and barriers to user-satisfaction of wearable and non-wearable devices in older adults with chronic insomnia with- or without-subjective cognitive decline (SCD).

Methods. Twenty participants aged 65+ with chronic insomnia, with- and without-SCD, used wearable and non-wearable devices and a mobile app for passive data tracking (e.g. GPS location), daily assessments and cognitive exercises over 14 days. The study assessed sleep quality, cognitive function, and mental health. Additionally, we administered several validated questionnaires to participants at baseline to assess insomnia severity, sleep quality, anxiety, depression, and SCD. At the end of the study, we administered an experience satisfaction questionnaire.

Results. Participants adhered to the study, as only 10% of our cohort withdrew their participation due to difficulties with the technology, all with-SCD. To investigate which factors predict participants' satisfaction with the use of at-home sleep technology, a multiple linear regression was performed with the following predictors: insomnia severity, sleep quality, anxiety, depression, and SCD while taking into consideration sex, age, and education factors. This model explained 59.2% of the variance in satisfaction scores. However, it did not reach significance ($p=0.240$) likely due to our small sample. Interestingly, SCD had a negative though non-significant coefficient ($\beta=-23.285$, $p=0.147$), suggesting that participants with-SCD had lower satisfaction with the devices. Insomnia severity had a moderate positive correlation with satisfaction ($r=0.504$, $p=0.016$), suggesting that participants with higher insomnia severity reported higher satisfaction with the devices.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Conclusion. In a small sample of older adults with chronic insomnia, at-home sleep technology was well-received, with higher satisfaction linked to greater insomnia severity, though lower in those with-SCD.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

113 Sleep in Elite Collegiate Football Players: Impact of Simple Sleep Recommendations on Fatigue and Cognitive Performance in Poor Sleepers

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: In high-risk sports like football a high prevalence of poor sleepers has been observed. We investigated the association between sleep and fatigue, and to whether sleep hygiene recommendations can improve sleep and reduce fatigue in “poor sleepers.”

Methods: Sixty-four football student-athletes (1.85±0.07m; 101±20kg) completed the PSQI, ISI, and Epworth questionnaires, identifying 29 poor sleepers. We present preliminary data from 16 of these athletes who participated in a two-week protocol involving nightly wrist actigraphy. Each week, they completed fatigue scales and performed a 5-min Psychomotor-Vigilance-Task (PVT) before and after a Paced-Visual-Serial-Addition Test (PVSAT). After week one, players were informed of their “poor sleeper” status and given sleep hygiene recommendations to implement during the second week.

Results: No increase in total sleep time was observed between week one (6:52±1:19h) and week two (7:05±1:22h; p=0.125), and no change in sleep efficiency was noted (94±2%, p=0.08). Fatigue scores remained similar across weeks (pre-PVSAT=5±2AU; p=0.91), increasing by 33% post-PVSAT (p<0.001). PVT accuracy was consistent between weeks and from pre- to post-PVSAT (94±8%), though reaction time increased from 274±27ms to 302±29ms after the PVSAT (p<0.001). From week one to week two, we observed an increase in PVSAT performance in terms of accuracy (from 68±15% to 80±15%; p<0.001) and reaction time (from 1.45±0.2s to 1.36±0.17s; p<0.001). Greater

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performance on the PVSAT was associated with smaller changes in fatigue (all $p \leq 0.01$). Greater sleep efficiency correlated with longer sleep duration ($r=0.4$; $p=0.02$) and lower fatigue change following the fatiguing task ($r=-0.41$; $p=0.02$), suggesting efficient sleep reduces fatigue during cognitive tasks.

Conclusions: These preliminary results, which will be extended to more athletes, suggest that sleep efficiency is related to fatigability and that more simple sleep hygiene recommendations may not lead to improvements in sleep in poor-sleeping elite collegial athletes.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

115 Dreaming of Fairness – A Scoping Review of Sleep Disparities in Canada

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background:

Social determinants of health are becoming increasingly recognized as critical drivers of health inequity worldwide. Sleep has been suggested as a potential mechanism by which social determinants might impact health and health disparities. To date, no comprehensive studies have characterized the social determinants of sleep health in Canada. Our goal was to conduct a scoping review, identify the social determinants of sleep health in Canada, and characterize this heterogeneous body of work to develop recommendations for policy and research.

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Methods:

We developed a comprehensive list of health disparity-associated terms in collaboration with the Sleep Consortium. Using 4 databases (MEDLINE, Embase, PsycINFO, and CINAHL) we identified 15,413 studies. Studies were included if (1) they were written in English or French (2) they were population-based (3) the participants were Canadian (4) they reported on one of several EDI themes (5) they investigated sleep, insomnia, or circadian rhythms. Three reviewers screened 15,413 abstracts and 240 full texts. The information extracted from the final 59 studies included the population characteristics/locations, EDI theme, sleep measure, and main outcome.

Results:

Of the initial 15,413 studies, 59 were extracted; 4 reported on gender minorities, 15 on discrimination/racism, 8 on immigrants/refugees, 43 on socioeconomic status, 38 on sexism, 1 on language, 1 on religious affiliation, 23 on housing/neighborhood characteristics, 8 on indigenous peoples, and 3 on family composition/caretaking. Only one study measured sleep objectively through actigraphy, the rest used questionnaires measuring sleep quality (29/59) or sleep quantity (27/59).

Conclusion:

Many studies report on SES and sexism as social determinants of sleep, but there is minimal research on other communities such as indigenous peoples and gender minorities. Additionally, there is a lack of objective measures of sleep, which is important for accuracy and informing policy-making and further research directions.

Submission Category | Catégorie de soumission

Sleep equity | Équité face au sommeil

124 Association of Social Vulnerability with Wait Time for Obstructive Sleep Apnea Care

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

Introduction: Obstructive sleep apnea (OSA) is a common chronic condition that is associated with several adverse consequences if untreated. Many Canadians experience barriers to timely OSA care, but it is unknown whether delays are more pronounced for socially vulnerable individuals. The aim of this project was to elucidate the relationship between social vulnerability and wait times for OSA care.

Methods: This is a secondary analysis of a large referral cohort at the FMC Sleep Centre in Calgary, Alberta. Social vulnerability for each patient was determined using the Canadian Index of Multiple Deprivation (CIMD), a comprehensive measure comprising four domains: economic dependency, residential instability, situational vulnerability and ethnocultural composition. We determined wait times for home sleep apnea testing (HSAT) and initial clinical assessment by a sleep physician. Regression analysis was used to determine associations between CIMD domains and wait times for both visit types, as well as with unattended appointments or cancellations for both home sleep apnea test and initial assessment.

Results: There were 1755 patients who attended a specialist appointment and 584 patients who underwent HSAT. Mean (SD) age was 58.1 (14.3) years and 59% were male. Multivariable linear regression revealed that older age ($p=0.001$) and higher BMI ($p=0.036$) were associated with shorter wait time for specialist assessment. Residential instability was associated with longer wait time for clinical assessment ($p=0.04$), and increased no-show or cancellation for HSAT ($p=0.005$). Similarly, situational vulnerability was also associated with increased likelihood for HSAT no-show or cancellation ($p=0.03$).

Conclusion: Residential instability and situational vulnerability were associated with delays for OSA care. Further research is required to determine if this association is due to patient factors or the structure of OSA care delivery.

Submission Category | Catégorie de soumission

Sleep equity | Équité face au sommeil

130 Patient Care within a Home Ventilation Program (HVP) in the Context of the COVID-19 Pandemic: Preliminary Survey Results

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background: Disruptions in services during the COVID-19 pandemic caused significant challenges for patients in a provincial home ventilation program (HVP). This study aims to understand the effects of the pandemic on patients' perceptions of healthcare, particularly in terms of home care, (respiratory or non-respiratory), access and satisfaction with services.

Approach: Adult patients who were in a provincial HVP between March 2020 and March 2022 were asked to complete a questionnaire, online, on paper (mail-in) or via telephone, between March 2023 and August 2024. Descriptive statistics were used.

Results: Respondents (n=125) were 50.8% female, aged 64.1±12.9 years, diagnosed with Obesity Hypoventilation Syndrome (49.1%), Neuromuscular Disease (21.9%), Chronic Obstructive Pulmonary Disorder (9.6%), Central Hypoventilation (5.3%), and Other (14.0%). 98.4% were vaccinated at least twice, and 43.0% experienced COVID-19 infection. Thirty-five (28%) patients relied on help for daily non-respiratory needs from a live-in caregiver and 26 (20.8%) from an

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external caregiver. Three (8.6%) and six (23.1%), respectively, experienced interruptions in home care. Among individuals who could not leave home without their ventilator (ventilator-dependent, n=17), 41.2 % relied on family/live-in and 52.9 % on an external caregiver for their daily needs. One experienced interruptions in live-in care and two in external care. Ten respondents (including two ventilator-dependent patients) reported interruptions in HVP services they felt necessary, specifically respiratory therapist checkup (n=4) and renewal of supplies (n=3). Delays in annual ventilator report download were reported by 10 respondents. One of them felt this contributed to their worsening health. Overall, 9.9% of respondents reported low satisfaction with HVP care during this period.

Conclusion: Preliminary results suggest that most Quebec HVP patients reported satisfaction with respiratory home services received during the COVID-19 pandemic. However, patients, including ventilator-dependent patients, and those receiving caregiver or external home care, experienced interruptions in non-respiratory and respiratory services.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

135 Contribution of Rare Variants in Sleepwalking Disorder

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Sleepwalking (SW) is a sleep disorder that belongs to the non-rapid eye movement (NREM) sleep family of parasomnias. Despite decades of research, its pathophysiology remains poorly understood. Familial and twin studies demonstrate that a strong hereditary component is at play. Indeed, evidence supporting that a subset of SW syndromes are inherited in a monogenic manner have been reported; however, very few molecular studies have been carried out to identify the

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genes involved. Thus, the genetic etiology of SW has not yet been studied in depth and studies with large cohort are needed to better understand the causes and risk factors of sleepwalking. We hypothesized that rare genetic variants are responsible for a subset of SW.

We assembled the largest sleepwalking cohort with genomic data to date, recruiting participants from Canada (Montreal) and France (Montpellier). Whole Exome sequencing (WES) was performed to identify and characterize rare variants and genes enriched in our SW cohort. Through this analysis, we found two interesting genes, which harboured rare variants, that could be possible candidates contributing to genetics form in SW. We aim to identify pathways and biological processes relevant to SW. Additionally, we will combine our genetic findings with clinical data to explore whether SW-specific genetic factors are linked to comorbidities or other clinical variables. This study represents the first large-scale analysis of rare monogenetic variants in SW and seeks to uncover variants and genes specific to sleepwalking disorder. These findings could serve as potential biomarkers or clinical markers associated with sleep disturbances. By focusing on rare variants as well as potential gene interactions, this research will deepen our understanding of SW's genetic etiology, improve diagnostic accuracy and advance targeted therapeutic strategies for managing sleep issues in this population.

Submission Category | Catégorie de soumission

Parasomnias | Parasomnies

137 Do Post Anesthesia Care Unit Events Predict Postoperative Adverse Outcomes in Patients with Obstructive Sleep Apnea ? A Systematic Review and Meta-Analysis informing SASM-SAMBA-SOCCA Tri-Society Guidelines

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background: Previous recommendations for the management of obstructive sleep apnea (OSA) have emphasized screening and intraoperative management, but lacked guidance on post-anesthesia care unit (PACU) events and their impact on outcomes. ¹⁻³ We conducted a systematic

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

review and meta-analysis to assess the role of PACU events in predicting postoperative adverse outcomes.

Methods: A comprehensive literature search was conducted across multiple databases from inception to October 11, 2024. Studies published in English, including adult patients undergoing non-cardiac surgery and assessing PACU events and postoperative outcomes were included. PACU event definitions were evaluated to inform evidence. Outcomes assessed were unplanned intensive care unit (ICU) admission, pulmonary complications, major adverse cardiac events (MACE), unplanned hospital readmission, and hospital/PACU length of stay. Risk of bias (RoB) was assessed using ROBINS-I, and Cochrane RoB-2 tools. Data was pooled using a random effects model to generate odds ratios (OR), mean differences (MD) and 95% confidence intervals (95%CI). Certainty of evidence, and strength of recommendations followed the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach. ⁴

Results: The search retrieved 18638 articles, with 8 observational cohort studies included. Majority of studies were at low RoB. PACU index event definitions included domains on definition of apneas, bradypneas, hypoxemia, need for pharmacological reversal, and pain-sedation mismatch. PACU events were predictive for unplanned ICU admission (OR 12.38 [95%CI 1.83,83.89]), pulmonary complications (OR 7.59 [95%CI 1.30, 44.30]), and MACE (OR 4.43 [95%CI 1.43,13.72]). They were also associated with an escalation of care. Quality of evidence was very low to low certainty, and was downgraded for observational study design, inconsistency, and imprecision.

Conclusion: We recommend that patients with OSA should be monitored for PACU events (low certainty, strong recommendation). We suggest that anesthesia care teams define PACU events in OSA care pathways, facilitating patient-specific treatment, monitoring, and disposition (low certainty, conditional recommendation).

Submission Category | Catégorie de soumission

Dental and surgical sleep medicine | Médecine dentaire et chirurgicale du sommeil

141 What Links Median Raphe 5-HT Neurons Activity and Vigilance States in Mice?

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

Serotonin (5-HT) modulates vigilance states, as highlighted by research on the dorsal raphe nucleus which contains the largest population of 5-HT neurons. However, the median raphe nucleus (MnR) contains a substantial amount of 5-HT neurons that project to brain regions involved in the physiology of sleep and wake.

This study investigates the link between MnR 5-HT neurons activity and vigilance states in mice.

A viral vector was infused in the MnR of SERT-Cre mice to enable conditional expression of the calcium sensor GCaMP6s in 5-HT neurons. Electrodes were implanted in the hippocampus to perform local field potentials (LFPs) recordings in the homecage. Combined with muscular activity recordings, they allowed to distinguish rapid eye movement (REM) sleep, non-REM sleep and wake states. An optic fiber was implanted above the MnR to perform fiber photometry recordings. We analyzed the concomitant changes between MnR 5-HT neuron activity at the population level and vigilance states. Besides, in another group of mice, a viral vector was used to drive the expression of the excitatory opsin ChETA by MnR 5-HT neurons. Through an optic fiber implanted above the MnR, these neurons were activated in the homecage or during active wake in a novel environment: an open field. We assessed how hippocampus LFPs and vigilance states were influenced by MnR 5-HT neurons activation.

Our results show that MnR 5-HT neurons are mainly active during wake and almost silent during REM sleep. Optogenetic activation of MnR 5-HT neurons influences electrophysiological properties of REM sleep by decreasing the frequency of hippocampal theta rhythm. In the open field, their activation seem to decrease the frequency of hippocampal theta rhythm activity with no influence on exploratory behaviors.

Altogether, our results provide a deeper insight into the influence of 5-HT neurons on vigilance states modulation.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

146 ActiGlobe: Automated Cross-continental Actigraphic Harmonizer

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction:

With extended recording time and portable capability, actigraphy data is often used as an indirect measure of active/rest patterns. While multiple tools have been developed to process actigraphy recordings, a few allowed longitudinal data harmonization involving long-distance/cross-time-zone travel. To resolve this issue, we developed *ActiGlobe*, an automated longitudinal recording harmonizer allowing pattern-based time correction for actigraphy.

Methods:

This project involved 23 longitudinal actigraphy recordings (*MotionWatch 8*) of local athletes training at the Institut National du Sport du Québec. Of all, 19 involved long-distance travel (local time: UTC-4/-5) for international competitions (2017: UTC+8 and +9, 2019: UTC +9) and back. Once all recording files of supported extensions (e.g., .csv, .awd, and .mtn) were imported, ActiGlobe iteratively harmonized each recording series after the initialization procedure (i.e., segmenting daily activity logs). Depending on the presence of individuals' travel logs, ActiGlobe would reorganize/harmonize daily recordings, and any internal documentation affected by cross-continental travelling, either manually or automatically. In brief, when automated, the bidirectional time-based clustering algorithm first grouped all recordings based on the sleep/wake time differences of all activity logs to the adjacent/first/last ones iteratively. To estimate each cluster's probable time zone, the algorithm then computed median bedtime differences between clusters to assess possible hours of time shift. Of all possible combinations, the algorithm finalized its estimation of probable time zones when all prospective time changes in a recording fell within the set boundaries of the International Internet Assigned Numbers Authority.

Results/Outputs:

To facilitate longitudinal actigraphy analysis, ActiGlobe would generate two reports (one graphic and one text-based) for each recording with a summary of the data harmonization process and daily linear cosinor analysis results. When enabling parallel processing, it would merge all text-based reports into one.

Conclusion:

Here, we presented ActiGlobe, an effective and easy-to-use tool to harmonize cross-continental actigraphy recordings.

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Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

148 The Absence of Neuroligin-2 Differentially Modulates Wake/sleep Architecture and Spectral Activity in Male and Female Mice

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Neuroligin-2 (NLGN2) is a synaptic adhesion molecule that is associated mainly to GABAergic neurotransmission and regulates behavioral states. Mutations in *Nlgn2* have been linked to neurodevelopmental disorders and dysfunction in synaptic plasticity. The loss of NLGN2 in male mice was shown to increase the time spent in wakefulness, decrease the time spent in slow wave sleep (SWS), and to alter electrocorticographic (ECoG) spectral activity. However, whether the lack of NLGN2 impacts wake/sleep states in female mice remains to be established. Here, we aimed to compare sexes for the impact of the absence of NLGN2 on the wake/sleep architecture, spectral activity, and responses to sleep deprivation (SD). *Nlgn2* knockout (KO) mice and wild-type (WT) littermates were implanted with ECoG electrodes, and ECoG signals were recorded for 48 h comprising a 24-h baseline (BL), a 6-h SD and 18 h of undisturbed recovery (REC). Time spent in wakefulness, SWS and paradoxical sleep (PS), and their alternation were interrogated, and ECoG activity was quantified using a standard spectral analysis. *Nlgn2* KO animals of both sexes spent more time awake and less time in SWS and PS, under both BL and REC conditions, with KO males spending less time in PS during the BL light and dark periods compared to WT males (difference only during BL dark in females). Moreover, *Nlgn2* KO animals displayed longer wakefulness and shorter SWS and PS episodes, and KO males (but not females) showed more wake and SWS episodes during the BL light period, suggesting an instability of vigilance states in KO animals. Finally, *Nlgn2* KO animals of both sexes showed spectral activity differences when compared to WT, notably a slower peak frequency during PS. This study highlights that the effects of lacking

NLGN2 on wake/sleep phenotypes differ between sexes, and could help understanding sleep disturbances in neurodevelopmental disorders.

Submission Category | Cat gorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

150 Comparison of Circadian Variation of Sleepiness and Driving Performance

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | R sum 

Fatigue and alertness impairment are associated with approximately 20% of fatal motor vehicle crashes worldwide. Alertness varies as a function of time awake and time of day, consistent with homeostatic and circadian processes. The diurnal variation of alertness may impact subjective and objective measures differently. The aim of the present study is to examine the circadian variation of sleepiness and driving performance.

Twelve healthy participants (5 females, 7 males, mean age \pm SD: 24.8 \pm 3.3 years) completed a 30-hour sleep-deprivation constant-routine protocol in dim light (<10 lux). Repeated assessments included sleepiness levels (Karolinska Sleepiness Scale, 4x/2 hours) and driving performance (30 minutes driving simulation, 1x/2hours). Standard deviations in driving speed (speed SD) and lane position (position SD) were derived from a straight road segment at the end of each simulation. A linear mixed-effects model analyzed the circadian and homeostatic variations in subjective sleepiness and driving performance over the 30-hour procedure. Bayesian circular mixed-effects regression models (R package “bnpreg”) were used to assess within-subject differences in circadian peaks of sleepiness and driving performance.

Results revealed significant circadian ($p \leq 0.03$) and homeostatic ($p \leq 0.004$) variations in both sleepiness and driving performance. According to individual circadian phase estimates, sleepiness peaks typically preceded those of speed SD (difference: -3.28 h, 95% CI: -6.78 to -0.08) and

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position SD (difference: -3.43 h, 95% CI: -6.32 to -1.01), though inter-individual variability was substantial.

Findings emphasize the importance of considering circadian rhythms in fatigue-related risk. The temporal mismatch between worst subjective and objective measures indicates that drivers could feel sleepiest several hours before their worst driving performance. Future studies could explore the relationship between the mismatch and elevated crash risks at certain times-of-day.

This study was supported by a grant from the Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST, grant number 2020-0006).

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

151 Electrophysiological Characterization of Yoga Nidra (Yogic Sleep) Meditation

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Yoga Nidra (YN), also known as 'yogic sleep', and increasingly referred to as 'Non-Sleep Deep Rest (NSDR)' in the scientific literature, is a guided meditation technique from ancient Indian traditions recognized for its psychological and physiological benefits. Unlike other seated meditation practices, YN is performed lying down, achieving a deeply relaxed state that resembles sleep while maintaining conscious awareness. Previous research suggests that YN enhances sleep quality, cognitive processing, and physical and emotional well-being, though the underlying neural mechanisms remain largely unexplored. This study aimed to characterize the topography of EEG during YN in young adults who completed both 30-minute Nap and Meditation conditions in the lab. The Meditation condition involved a structured Yoga Nidra session comprising nine phases: Preparation, Affirmation-Beginning, Body Scan, Breath, Polarities, Visualization, Silence, Affirmation-End, and Ending. Participants (n=15) practiced the meditation at home for two weeks, at least four times per week, culminating in a final session in a controlled laboratory setting. Brain activity was recorded during each session from 32 EEG sites. Results: 1) During YN, Delta and Theta EEG power peaked mid-session (Breath phase) and then declined, while the nap showed a linear increase in these waves across phases with higher sustained amplitudes. 2) YN showed sustained posterior Alpha activity, contrasting with Alpha decreases during the nap. 3) Frontal Sigma was absent during YN, unlike the nap, where it was sustained in frontal and posterior

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regions. 4) Notably, YN demonstrated higher Beta and Gamma EEG power, indicating greater cognitive engagement compared to the nap. Together, these results support that YN induces a state of relaxation characterized by a unique combination of conscious awareness and sleep-like brain activity, distinguishing it from typical sleep. Future research could further investigate the connection between these unique brain states and behavioral and health outcomes.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

152 Sleep Spindles and Slow Oscillations Predict Amyloid Beta, Tau Pathology, and Cognition in Persons With Mild to Moderate Alzheimer's Disease."

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: Sleep plays vital roles in brain-health and cognition, including regulating clearance of β -amyloid (A β) and tau proteins that hallmark Alzheimer's disease (AD). Changes in sleep physiology can predate cognitive symptoms by decades in AD, but it remains unclear which sleep characteristics predict cognitive and neurodegenerative changes after AD onset.

Methods: Using data from a prospective cohort study of mild-to-moderate AD (n=60, 30 female, mean age 74.7) in Lleida, Spain, we analysed non-rapid eye-movement sleep spindles and slow oscillations (SO) at baseline and their associations with baseline amyloid-beta and tau, and with cognition from baseline to three-years follow-up.

Participants underwent polysomnography (PSG), blood and cerebrospinal fluid draws for amyloid and tau at baseline, and neuropsychological assessment at baseline, 12, 24 and 36 months with the Mini-Mental Status Examination (MMSE), California verbal learning test (CVLT), Rey-Osterrieth

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Complex Figure Test (ROCF), Alzheimer's Disease Assessment Scale–Cognitive Subscale (ADAS-Cog).

Spindle and SO detection were performed using in-house, open-source software packages developed at Concordia University. Associations between SO and spindle and SO duration, density, power, amplitude, AD biomarkers, and cognition from baseline to 36 months were investigated with false discovery rate-adjusted generalised linear models adjusted for age, sex, apnoea-hypopnea index.

Results: We found previously unreported associations between spindle characteristics, biomarkers, and cognition in persons with AD. Higher spindle and SO activity predicted significant changes in, tau, and tau/A β 42 at baseline, clinically and statistically significantly lower Alzheimer's Disease Assessment Scale Cognitive Subscale (better cognitive performance) and higher Mini-Mental State Examination scores from baseline to 36-months. Spindles and SO mediated the effect of pTau181/a β 42 on cognition, while pTau181/a β 42 moderated the effect of spindles and SO on cognition.

Conclusions: Our findings demonstrate that spindle and SO activity during sleep constitute predictive and non-invasive biomarkers of neurodegeneration and cognition in AD patients and novel treatment targets for delaying cognitive decline and AD progression.

Submission Category | Cat  gorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurod  g  nescence

153 Investigating Arousal Stability During Sleep

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UBC, Vancouver, BC, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | R  sum  

Introduction

Arousal disturbances during sleep, as seen in sleep apnea, are associated with various disorders. Many current methods of quantifying arousal instability rely on technician labels. This is resource intensive and limits the temporal resolution. Several automated methods focussed on single arousal dimensions have also been developed. However, multiple arousal dimensions including cortical, autonomic, and behavioural, have been described in past literature. Hidden Markov Models (HMMs) are automated, data-driven, and can capture the hidden arousal state dynamics.

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We compare an HMM trained on observations from multiple arousal dimensions to one trained on cortical alone. We hypothesize that the state dynamics from multidimensional arousal observations will correlate more strongly to the apnea hypopnea index (AHI), a clinical measure that is associated with sleep disturbance arising from sleep-disordered breathing.

Methods

We analysed participants from open-source datasets. Three features correlated with different arousal dimensions were extracted in 3s windows. Participants with normal AHI values were used to train two HMMs, one based cortical arousal observations (HMM1), and one based on cortical, autonomic, and behavioural arousal observations (HMM2). These HMMs were then used to decode the most likely arousal state paths in participants with moderate-to-severe apnea. The state switching rate was calculated from these state paths. A Pearson's correlation coefficient was used to compare the switching rate of each HMM to AHI.

Results

A significant positive correlation was found between switching rate and AHI for both HMM1 and HMM2. The correlation coefficient was higher for HMM2 ($r=0.66$, $p<0.001$) compared to HMM1 ($r=0.31$, $p<0.001$), which supports our hypothesis.

Discussion

Hidden arousal state dynamics correlate more strongly with AHI when trained on multiple arousal dimensions. Future work will explore the relationship between specific state transitions and daytime impairments. Examining which arousal dimensions drive transitions may provide insight into the mechanism of arousal instability in sleep apnea.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

155 Comparative Analysis of Sleep and Daytime Function Outcomes Associated with the Use of Prescription Medications or Cannabis as Sleep Aids in Canadian Adults: Preliminary Observations

Ms. Karina Fonseca¹, Dr. Charles M. Morin^{2,3}, Dr. Lydi-Anne Vézina-Im^{2,3}, Dr. Hans Ivers^{2,3}, Dr. Colleen E. Carney⁴, Dr. Jean-Phillippe Chaput^{5,6}, Dr. Thien Thanh Dang-Vu^{7,8}, Dr. Judith R. Davidson⁹, Dr. Rebecca Robillard^{1,10}, On behalf of the Canadian Sleep Research Consortium¹¹

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background

Sleep issues represent a common motive for cannabis use. The ease of access to cannabis since its legislation in Canada calls for a better understanding of its use as a sleep aid and its potential effects compared to standard sleep pharmacotherapy.

Methods

A phone interview was conducted (April-October 2023) with a stratified population-based sample of 4,037 Canadian adults (57% females; mean age: 50.6±18.4 years). Respondents were asked about sleep aid use. The presence and frequency of sleep difficulties and daytime functioning in the past month were compared across two groups: individuals using prescription medications but not cannabis (n=135) and those using cannabis for sleep but not prescription medications (n=149).

Results

Of all respondents who relied on sleep aids in the past year (N=284), 31% used prescription medications and 33% used cannabis. On average, prescribed sleep medications were used 3.8±2.9 nights/week and cannabis was used 3.8±2.7 nights/week. After adjusting for age and sex, there was no significant group difference in reported sleep initiation, maintenance, or early awakening difficulties, nor in sleep duration ($p>.114$). Compared to the prescription medication group, the cannabis group reported a slightly but significantly higher level of satisfaction with their sleep ($p=.041$), lower levels of sleep-related preoccupations ($p=.013$), and lower rates of self-reported psychological difficulties (28% vs 41%; $p=.002$).

Conclusions

The proportion of Canadians using cannabis as a sleep aid and the frequency of use are equivalent to what is observed for prescribed sleep medications. Preliminary observations suggest that the

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subjective sleep profiles of individuals using cannabis is indistinguishable from that of prescription medication users, although using cannabis was associated with better sleep satisfaction and daytime functioning. Limitations include the lack of information on the severity of sleep problems prior to using sleep aids. Comparative randomized clinical trials with objective measures are required.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

156 Investigating the Relationship Between APOE4 Allele and Insomnia Symptoms.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: The pathological processes associated with the *APOE4* allele, a critical genetic risk factor for late-onset Alzheimer's disease, might disrupt sleep. This study investigated the relationship between the *APOE4* allele and subclinical insomnia symptoms in non-demented older adults.

Methods: The study involved 87 participants without dementia, divided into two groups based on their *APOE4* carrier status: 19 carriers (mean age: 65.05 ± 6.75, 12 males, 7 females) and 68 non-carriers (mean age: 64.64 ± 6.58, 48 males, 14 females). All participants completed the Insomnia Severity Index (ISI), yielding mean scores of 7.05 ± 4.81 for carriers and 8.09 ± 5.22 for non-carriers. These scores indicate varying levels of insomnia symptom severity between the two groups. However, it is important to note that none of the participants received a formal diagnosis of insomnia. Linear regression analyses compared the overall ISI scores and individual ISI items between *APOE4* carriers and non-carriers while controlling for age and sex.

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Results and Discussion: No significant differences in overall ISI scores were observed between *APOE4* carriers and non-carriers. However, a trend ($p=0.07$) emerged in the ISI subscale related to sleep maintenance, where non-carriers reported more difficulty maintaining sleep than carriers. Additionally, age and being a woman were associated with higher ISI scores.

Conclusion: Although the overall severity of insomnia did not significantly differ between carriers and non-carriers in our study, the relationship between genetic risk factors and sleep disturbances appears to be more complicated than we previously realized. Notably, alterations in sleep patterns linked to *APOE4* may not fully represent self-reported insomnia symptoms, underscoring the importance of objective evaluations of sleep microstructure.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

157 Parasomnias: High Prevalence, Low Coping Skills in Post-Secondary Students

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Parasomnias are disruptive sleep-related disorders, measured by the Munich Parasomnia Screening (MUPS), which includes 21 parasomnias. We surveyed the prevalence and coping strategies of these parasomnias in post-secondary students via online questionnaire. The frequency of parasomnias and their coping strategies are reported.

We found that parasomnias are highly prevalent among college and university students. 92% of participants experienced at least one parasomnia during the past year. We coded the subjects' coping responses into the following categories: preventative strategies, distraction, grounding strategies, physical manipulation of body, and other strategies. The most frequently mentioned coping strategies were grounding strategies (32%) (e.g., relaxing and calming oneself down). Given the prevalence of parasomnias in this population, and the paucity of reported coping strategies, we did an extensive literature review and identified clinical treatments for each parasomnia, which have proven to be effective.

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Clearly, this unexpectedly high prevalence of parasomnias among post-secondary students reflects a need to increase student knowledge about the non-pharmacological treatments to improve their sleep quality and mental health. This research contributes new information about the parasomnias among post-secondary students as well as provides guidelines for possible coping strategies and interventions.

Submission Category | Catégorie de soumission

Parasomnias | Parasomnies

159 Characterization of Functional Connectivity During Sleep and Its Evolution Throughout the Night: A High-Density EEG Study

Ms. Maya de Sulzer Wart^{1,2}, Ms. Hanieh Bazregarzadeh¹, Ms. Hélène Blais¹, Mr. Charles Gervais^{1,3}, Ms. Rosalie Girard Pepin^{1,4}, Dre. Julie Carrier^{1,5}, Dr. Jean-Marc Lina^{1,6}, Dre. Nadia Gosselin^{1,5}, Dre. Catherine Duclos^{1,2,7}

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: Sleep stages are associated with distinct physiological, cognitive and restorative properties, yet little is known about how the brain's functional networks serve these functions. Characterizing functional connectivity could help understand profound differences in neurophysiological activity across sleep stages, and its evolution throughout the night.

Methodology: We recorded overnight polysomnography using 256-channel electroencephalography (EEG) in 16 adults (50.2±19.1 years, 6 females). We extracted the first and last episodes of each sleep stage (N=86), as well as wakefulness before and after the sleep episode (N=32), with a minimal duration of 3.5 minutes. Weighted phase lag index (wPLI) was used to calculate clustering coefficient, modularity, global efficiency, path length and small-worldness. To assess criticality, we calculated Lempel-Ziv complexity (LZC), chaoticity, proximity to edge-of-chaos criticality (PECC), and the pair correlation function (PCF). Two-way repeated measures

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ANOVAs, with post-hoc tests with Holm correction, were used to compare sleep-wake stages and timing (first vs. last episode).

Results: All measures, except PCF, showed significant differences across sleep-wake stages (p -values $<.001$). N2 and N3 exhibited shorter path lengths, as well as greater clustering, global efficiency, small-worldness, and modularity compared to wakefulness and REM (p -values $<.05$). Wakefulness had higher chaoticity than N3 and REM (p -values $<.01$) and N3 had higher PECC than wakefulness ($p<.05$). LZC was higher in wakefulness and REM than in N2 and N3 (p -values <0.001), N2 being higher itself than N3 ($p<.01$). The only measure that showed a significant timing effect was LZC ($p<.01$), being higher for later than earlier episodes. Additionally, chaoticity, PECC and LZC showed a significant interaction between sleep stages and timing (p -values $<.05$).

Discussion: These results broadly indicate that NREM sleep is associated with increased functional network efficiency, small-worldness and criticality, and reduced complexity and chaoticity, while REM is associated with higher complexity, similar to wakefulness. The complexity difference between timings may reflect sleep's restorative functions.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

162 The Association Between Insomnia, Nightmares, and Suicide: A Systematic Literature Review.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Sleep disturbances, particularly insomnia and nightmares, have been increasingly recognized as significant risk factors for suicide. Nightmares are distressing and vivid dreams that can heighten emotional responses and cognitive awareness of threat, with distress often spilling over into waking states. Insomnia is characterized by difficulty falling asleep, staying asleep, or waking up too early, leading to impaired daytime functioning and heightened emotional distress. However, the existing literature remains scattered across various studies and lacks synthesis, limiting our understanding of how sleep quality directly contributes to suicide risk. This review addresses this gap by systematically organizing and synthesizing existing data to clarify the role of insomnia and nightmares in suicide risk.

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A systematic literature review was conducted to examine the literature, restricted to studies published between 2013 and 2024, to evaluate the relationship between insomnia, nightmares, and suicidal behaviours, to identify key mediating factors that influence these associations and to explore the potential causal mechanisms linking sleep disturbances to suicide risk. Sixty of 118 articles screened met the inclusion criteria and were chosen for analysis.

Findings reveal insomnia and nightmares as significant predictors of suicidal behaviour, ideation and attempts. The severity of insomnia and the emotional intensity and distress of nightmares were positively associated with and contribute to elevated suicide risk. Several factors, including emotional dysregulation, were identified as mediating the relationship between sleep disturbances and suicide. Cognitive impairments, such as decision-making deficits, were found to exacerbate suicidal ideation. Comorbid psychiatric conditions, including PTSD, amplified the risk of suicide associated with sleep disturbances. Studies emphasized the need for integrating sleep-focused treatments into broader suicide prevention strategies since interventions addressing the sleep disturbances showed potential in reducing suicide risk.

Through compiling, structuring and integrating dispersed data, this review provides clearer insights into the role of sleep disturbances in suicide risk and highlights the need for targeted interventions.

Submission Category | Catégorie de soumission

Sleep, dreams and mental health | Sommeil, rêves et santé mentale

165 Can We Induce Lucid Dreams Using Sleep Interruption? a Systematic Review and Meta-Analysis

Ms. Raphaëlle Semin¹, Dr. Remington Mallett^{1,2}, Dre. Michelle Carr^{1,2}

¹Center for Advanced Research in Sleep Medicine, CIUSSS-NIM, Montreal, Québec, Canada.

²Department of Psychiatry and Addictology, University of Montreal, Montreal, Québec, Canada

ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Awareness of dreaming while still asleep, or lucid dreaming, often involves the ability to control dream content and is associated with reduced nightmares and learning benefits. However, despite promising pilot results, rigorous scientific studies on the impacts of lucid dreaming are scarce due to low sample sizes, because lucid dreams occur only rarely. Thus, a critical research challenge in recent years has been developing reliable methods to induce lucid dreams in the laboratory. One promising approach involves waking up after approximately 5 hours of sleep, staying awake for 20–60 minutes, and returning to sleep with the intention of becoming lucid. Though this “wake-back-to-bed” (WBTB) approach is often referred to as a highly effective method to induce lucid dreams,

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publications on the topic reveal mixed results. To identify the reliability of the WBTB technique for inducing lucid dreams, we conducted a meta-analysis that included all existing related studies. Applying PRISMA-guideline-based exclusion criteria, 680 papers were screened, yielding a final set of 22 studies. When aggregating results across all final studies, preliminary analysis indicates a significantly higher lucid dreaming frequency in WBTB conditions compared to control conditions. These results provide strong empirical support for the efficacy of WBTB as a method to induce lucid dreams. Further analysis might reveal how different implementations of this method impact results (e.g., varying the activity or duration of the brief awake period).

Submission Category | Catégorie de soumission

Sleep, dreams and mental health | Sommeil, rêves et santé mentale

171 Patient Perceptions of Daily Movement Behaviours in Obstructive Sleep Apnea: Impact of Sleep and CPAP Therapy

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Obstructive sleep apnea (OSA) is associated with daytime symptoms and linked to poor health outcomes. While increased physical activity reduces the risk of comorbidities, individuals with OSA can exhibit reduced physical activity. Daytime OSA symptoms may pose a barrier to physical activity; however, this is incompletely understood. Moreover, research into whether continuous positive airway pressure therapy (CPAP) may reduce barriers to facilitate higher levels of physical activity in OSA patients is equivocal. Here, we characterised the sleep, symptom, and physical activity-related lived experiences of OSA patients prior to and during CPAP therapy to investigate the potential impact of CPAP on physical activity.

Semi-structured interviews were conducted with individuals with OSA (AHI: 32.5 ± 29.5), prior to initiation of physician-prescribed CPAP therapy ("pre"; $n=17$, $m7: f10$) and three months after initiation of CPAP therapy ("3mo"; $n=7$ complete, $m3: f4$). Interview transcripts were analysed through hybrid thematic analysis using NVivo Software. Quantitative actigraphy data (ActivPAL)

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were collected for one week at both the pre- and 3mo interview timepoints and CPAP downloads were obtained at 3mo to obtain device usage.

Participants consistently reported poor perceived sleep quality, as well as impaired daytime performance and engagement in physical activity, pre-CPAP therapy ($n=16/17$). Lack of motivation and fatigue were the most reported perceived barriers to physical activity. After 3mo CPAP (5.8 ± 2.1 hours/night), all 3mo participants ($n=7$) reported improved sleep quality and reduced burden of daytime symptoms. While some participants ($n=3$) reported higher self-perceived levels of physical activity at 3mo, this was not reflected in quantitative actigraphy outcomes (daily step count $n=7$: pre 7799.1 ± 3768.3 vs 3mo 7613.5 ± 3663.0).

Our preliminary findings suggest that CPAP therapy reduces daytime symptom burden and perceived barriers to physical activity in OSA. Future directions will expand recruitment to explore whether this translates to quantitative changes or improved quality of life.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

180 Effects of Cognitive Behavioral Therapy for Insomnia on Immune and Cardiovascular Health

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

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Abstract | Résumé

Insomnia is linked to physiological hyperarousal, increased inflammatory markers and decreased autonomic nervous system activity, although some studies report no difference. The effects on cognitive-behavioral therapy for insomnia (CBTi) on immunological and cardiovascular measures remain debated. This randomized controlled trial aimed to assess whether CBTi reduces cardiovascular and inflammatory biomarkers (<https://doi.org/10.1186/ISRCTN13983243>).

Participants with chronic insomnia (DSM-5 criteria) were randomized into a 3-month group-CBTi program (CBTi group, N=29, 22F) or a 3-month wait-list (WL group, N=33, 25F). Baseline assessments (T1) included polysomnography, morning ambulatory cardiovascular recordings and blood draws, which were repeated 3 months post-randomization (T2). Inflammatory markers included CRP, TNF- α , and IL-6. Cardiovascular indices included systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR) and diurnal and nocturnal heart rate variability (HRV). HRV parameters were extracted from the whole night, from the first 90min of sleep and from the morning recording. Repeated-measures ANOVA compared groups at T1 and T2, with age and sex as covariates.

No significant main effects of group or time, nor their interaction, were found on inflammatory markers ($p_{\text{all}} > .05$). For cardiovascular measures, no significant main effects of time or the interaction group*time were observed. The CBTi group showed lower DBP and increased HF power compared to the WL group ($p_{\text{all}} < .01$). Additionally, age correlated with higher SBP ($p < .001$), increased IL-6 ($p < .05$), increased TNF- α ($p < .05$) and decreased RSA-HRV during sleep ($p_{\text{all}} < .01$).

Our results did not corroborate elevated circulating inflammatory biomarkers or decreased autonomic nervous system activity in insomnia. This study found no benefits of CBTi on inflammatory and cardiovascular outcomes. A 3-month follow-up may be insufficient to detect physiological changes. Future analyses should consider sleep stages or cycles in HRV measurements to better assess autonomic nervous system modulation during sleep.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

183 Decoding Declarative Memory Reactivation During Sleep Spindles in Humans Using Simultaneous EEG-fMRI Recordings

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction

Endogenous memory trace reactivation during sleep as a key memory consolidation mechanism has been well-documented in animal models. In humans, however, there is a lack of direct evidence given that the vast majority of studies assume that this process occurs during the night, but provides only correlational evidence for it (e.g., sleep characteristics associated with better post-sleep memory performance). Here, we seek to (1) provide direct evidence for memory reactivation during sleep using machine-learning and simultaneous functional neuroimaging (fMRI) and electroencephalography (EEG) recordings and (2) demonstrate that this process is linked to sleep spindles that are clustered less than 6 seconds apart.

Method

Twenty-four adults learned the location of human faces and scenes in a rectangular matrix. On Day 1, participants learned one image category and slept in the MR scanner while EEG was recorded. On Day 2, they learned the other category and performed a localizer task with items from both categories that was used to train a binary classifier. Memory retention was assessed on both days using cued-recall, pre- and post-sleep for the first category. The two categories were presented in a counterbalanced order across participants. Memory reactivation during sleep was assessed using fMRI data and the binary classifier distinguishing between the neural representations associated with each image category (e.g., Day 1 vs. Day2). EEG data was used to identify sleep stages and spindles.

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Results and Conclusion

As predicted, the pattern specific to the pre-sleep learned image category was significantly identified above chance during N2 sleep stage and during sleep spindles. Moreover, the classifier performance was better during clustered versus isolated spindles. The absolute number of memory reactivations correlated positively with post-sleep declarative memory performance. Compared to univariate techniques, the multivariate approach employed here allows for better quantification of content-specific declarative memory reactivation during sleep.

Submission Category | Catégorie de soumission

Sleep, brain plasticity and memory | Sommeil, plasticité cérébrale et mémoire

185 Putting Our Heads Together to Envision Sleep Health for Youth: Knowledge Exchange Highlights From a Youth Summit

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background. Youth is a sensitive period for sleep-related difficulties. While sleep is a critical component of adolescent physical development, academic outcomes, and mental well-being, youth often have difficulties falling asleep, delayed sleep phase, and curtailed sleep. Consulting youth with lived experiences may help inform sleep-health promotion initiatives. Our overarching objective was to gather youth perspectives on the best ways to promote sleep health for this age group. Specifically, we sought to better understand the sleep strategies used by youth, the implementation challenges they face, and their recommendations for sleep health promotion.

Methods. Youth perspectives on sleep health were gathered through community engagement. Thirty secondary-school-level youth attending a youth summit actively participated in a sleep knowledge exchange session. They were prompted with questions about

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sleep and formed multiple discussion groups to formulate and share ideas. Common themes emerging from these discussions were derived.

Results. Youth identified several mental and physical health, environmental, and lifestyle factors impacting sleep, such as stress, pain, blue light, and irregular sleep schedules. They described various sleep-aiding strategies: the most frequent were behavioural, followed by sensory, substance (e.g. caffeine), cognitive and schedule-related strategies. Sleep barriers highlighted included electronics, noises, hyperarousal, caffeine, inconsistent sleep patterns, and sleep aid inaccessibility. They placed a high level of importance on sleep schedule maintenance, accessible sleep aids, and increasing knowledge about the effects of unhealthy sleep.

Conclusions. Based upon the perspectives of youth with lived experience, sleep health promotion initiatives for youth should focus on explaining the impacts of poor sleep and solutions to facilitate and protect sleep. They are open to a wide range of sleep strategies. Early psychoeducation about caffeine use may be important. These perspectives highlight important areas to integrate in sleep education efforts and resources adapted for youth.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

187 Evaluating the Use of Acoustic Features in Diagnosing Obstructive Sleep Apnea: A Systematic Review

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Despite advancements in sleep medicine diagnostics, polysomnography (PSG) remains the gold standard for diagnosing obstructive sleep apnea (OSA). This method is associated with limitations including cost, labor-intensiveness, and limited accessibility. Recently, the analysis of acoustic features related to snoring and breathing patterns has emerged as a novel way of diagnosing OSA, often with the aid of artificial intelligence (AI). A systematic review of publications indexed in Medline, Embase, and CENTRAL was conducted using the PRISMA framework. Of 14,163 studies, 38 met the inclusion criteria. Most of these studies (n=35, 92%) focused on adult patient populations, while three studies (8%) evaluated pediatric patients. Most studies assessed the use of acoustic features only (89%), with a minority (n=4, 11%) integrating a combination of sound and oximetry features. AI-based analysis was employed in 18 studies (51%), with logistic regression (n=6), random forests (n=4), and support vector machines (n=4) being the most frequently used

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algorithms. Among studies evaluating the use of acoustic features in diagnosing moderate to severe adult OSA (AHI >15), the majority (n=14, 56%), achieved high diagnostic accuracy (sensitivity and specificity ≥80%). Similarly, for the diagnosis of severe adult OSA (AHI >30), most studies (n=9, 69%), achieved high accuracy levels. However, for studies evaluating the presence of any OSA in adult populations (AHI>5), diagnostic accuracies were more mitigated, with eight out of nineteen studies (42%) finding a combination of high sensitivities and specificities (≥80%). Current research on acoustic biomarkers for diagnosing OSA has focused on adult populations with promising results for the diagnosis of moderate to severe OSA. However, most of these methods remain in pre-clinical stage. The integration of acoustic biomarkers into OSA diagnostics has the potential to address some of the limitations of PSG, particularly in terms of accessibility and convenience, marking an important step towards personalized and patient-centered sleep medicine.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

189 Differential Roles of *Nlgn2* Splice Variants in Shaping Vigilance States

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Sleep disturbances negatively impact health in mammals. To improve sleep duration/quality, a greater understanding of the underlying regulatory mechanisms is needed. Vigilance states are modulated by neurotransmission through changes at the synaptic level involving, among others, synaptic adhesion molecules such as Neuroligins (NLGN). NLGN2 mainly regulates inhibitory transmission, yet exists in two isoforms that are differentially expressed between glutamatergic and GABAergic synapses. We previously showed that *Nlgn2* knockout (KO) mice have reduced time spent asleep under baseline (BL) and sleep deprived (SD) conditions with massive changes in their electrocorticographic (ECoG) activity, including increased delta activity (1-4 Hz) during slow-wave sleep (SWS). However, the mechanisms by which NLGN2 controls sleep-wake duration and quality remain to be clarified. We here investigate the roles of the different NLGN2 isoforms in shaping

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vigilance states. Adult, male and female, *Nlgn2* KO mice and wild-type (WT) littermates were infected in the motor and visual cortices with a virus containing a plasmid encoding either the A+ or A- NLGN2 isoform. Mice underwent ECoG electrode surgical implantation, and the signal was recorded for 24h of BL, 6h of SD, and 18h of recovery. Preliminary data shows that *Nlgn2* rescue can reverse some of the KO phenotypes (e.g., reduce the increased SWS delta activity), while the overexpression in WT has opposite effects. The differential isoform effects and sex-specific phenotypes however remain to be clarified. Gene expression quantification of synaptic components in the cerebral cortex suggests compensation by other adhesion molecules in KO animals. Future analyses will include behavioral testing (e.g. anxiety, nesting, social interactions) to address the relationships between sleep and comorbidities observed in neurodevelopmental disorders. Overall, this work will increase the understanding of the mechanisms by which NLGN2 shapes vigilance states and potentially uncover a druggable target for sleep-wake modulation with applications for neurodevelopmental disorders.

Submission Category | Catégorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

192 REM Sleep Behaviour Disorder in Response to PAP Treatment of Obstructive Sleep Apnea; Secondary Analysis of a Randomized Controlled Trial in Parkinson's Disease.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

Abstract | Résumé

Background: REM sleep behaviour disorder (RBD) is frequently concurrent with obstructive sleep apnea (OSA) in Parkinson's disease (PD). This study investigated the impact of treatment of concomitant OSA on RBD features in patients with PD.

Methods: Participants underwent diagnostic polysomnography (PSG), were randomized to positive airway pressure (PAP) or control for 6 months, then underwent follow-up PSG. RBD (at baseline) was identified based on RBD symptoms and EMG features (either). Either symptoms or EMG features alone constituted "probable RBD". EMG features were compared between baseline and treatment within groups and change between groups, using paired or unpaired t-tests, respectively. Questionnaire responses were compared within and between groups using chi-squared tests.

Results: 94 participants were randomized (31% female) with mean age 67.3 (SD 10.5) years, body mass index 28.1 (4.7) kg/m². Of the 48 PAP-treated patients, 20 had definite or probable RBD; 11 met tonic, 12 phasic EMG criteria, and 19 questionnaire criteria at both timepoints. Of the 46 control patients, 29 had definite or probable RBD; 20 met tonic and phasic EMG criteria and 28 questionnaire criteria at both timepoints. No significant differences in EMG features were found within the treatment and control groups (baseline vs. follow-up) nor between groups. However, in the PAP group, 16 reported body movements, shouting or yelling during sleep at baseline compared to 8 on treatment ($P=0.01$). At follow-up, in the PAP group, 5 reported improvement in nocturnal events and 4 no change, vs. 2 and 18, respectively, in controls ($P=0.03$).

Conclusion: Treatment of concomitant OSA with PAP may improve RBD symptoms in PD patients. Further studies are warranted to evaluate the long-term effects of treatment of OSA on RBD in PD.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

199 Nocturnal Heart Rate Variability as a Neurodegenerative Signature in Idiopathic REM Sleep Behavior Disorder: A Temporal-to-Phase-Space-Decomposition Analysis

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction:

Idiopathic REM Sleep Behavior Disorder (iRBD) is currently the strongest prodromal predictor for parkinsonism, with most developing Parkinson's disease (PD) or dementia with Lewy body (DLB). Despite DLB's greater association with autonomic dysfunctions, reduced daytime heart rate variability (HRV) is more frequently noted as an early sign of PD due to cardiac denervation. With less respiratory sinus arrhythmia at night and the stage-dependent vagal activity changes, the brain-first DLB neurodegeneration may alter some nocturnal HRV patterns. Inspired by the traditional Poincaré analysis, we assessed nocturnal HRV sympathovagal balance in patients with iRBD via principal component analysis-based (PCA) temporal-to-phase-space-decomposition.

Methods:

The study included 163 (126 iRBD; with 15 DLB and 21 PD phenoconverters, and 37 disease-free) polysomnography recordings from the Montreal RBD cohort. Visual scoring was done for every 30-second epoch. R-peaks were detected using Pan's algorithm with local maxima correction for time. Anomaly-free successive RR intervals were used to compute elliptic axis ratios for each sleep stage after temporal-to-phase-space-decomposition. Within group changes in axis-ratio (i.e., sympathovagal balance measure) were evaluated across sleep stages via Friedman rank sum test with Durbin-Conover pairwise comparisons, adjusted via Hommel correction. Age-and-sex-adjusted association between axis-ratio and phenoconversion outcome was assessed via the random-effect panel data model.

Results:

Disease-free participants and patients with iRBD shared similar distributions in age (67.4 ± 9.28 vs. 65.8 ± 8.02 years) and sex (%Male=63.6 vs. 72.5). Patients with iRBD showed greater axis-ratio during both N2 (median=0.24, $p < 0.001$) and N3 (0.30, $p < 0.001$) than N1 stage (0.23). Axis-ratio significantly reduced from N3 to REM sleep (0.21, $p < 0.001$). Similar patterns were found among disease-free participants and DLB phenoconverters, while absent among PD phenoconverters. When compared to disease-free participants, DLB phenoconverters showed increased axis-ratio stage-wise (β [95%CI]=0.13[0.06,0.19]).

Conclusion:

We found possible increase in overall vagal activity during sleep in DLB, while stage-dependent changes were absent in PD.

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Submission Category | Catégorie de soumission

Parasomnias | Parasomnies

205 The Relationship Between Sleep Eeg Functional Connectivity and Cognitive Function in Parkinson's Disease

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction:

Changes to sleep are common in Parkinson's disease (PD) and have been associated with worse cognitive performance. Much of this work has focused on either global measures of sleep architecture or on specific oscillations (e.g., sleep spindles). More recently, EEG-derived functional connectivity has also emerged as a possible predictor of cognitive function but little is known about the degree to which patterns of EEG connectivity during sleep can be associated to cognitive function in PD.

Method:

PD patients (n=52) and older adults (n=34) underwent a neuropsychological evaluation of five cognitive domains (attention, executive function, learning and memory, visuospatial abilities and language) and overnight polysomnography. EEG functional connectivity was measured using imaginary coherence in NREM2 and NREM3 across the delta, theta, alpha, low sigma and high sigma frequency bands. We used partial least squares correlational analysis to investigate the patterns of associations between sleep EEG functional connectivity and cognitive performance.

Results:

In NREM2 we identified a significant latent variable that explained 32% of the covariance between EEG connectivity and cognition across PD patients and controls. This latent variable was associated with worse performance in all cognitive domains and with higher connectivity in delta, theta and alpha bands and lower connectivity in low and high sigma bands. In NREM3 the identified significant latent variable explained 47% of the covariance between sleep EEG and cognition. This latent variable showed a pattern of worse memory associated with increased connectivity across

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all frequency bands. In post-hoc analyses, we found that the expression of the brain pattern identified in NREM-2 was significantly more expressed in patients, whereas there were no differences in the expression of the NREM3 brain pattern between patients and controls.

Conclusion:

These results suggest that connectivity during NREM-2 and NREM-3 is linked to cognition in distinct ways – highlighting either aspects specific to PD or common age-related factors

Submission Category | Catégorie de soumission

Sleep, aging and neurodegeneration | Sommeil, vieillissement et neurodégénérescence

208 Evaluating the Use of Enhanced Monitoring Tools for Postoperative Management of Obstructive Sleep Apnea: A Systematic Review and Meta-Analysis Informing SASM-SAMBA-SOCCA Tri-Society Guidelines

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background: Obstructive sleep apnea (OSA) has a high prevalence and is associated with adverse perioperative outcomes.^{1,2} We conducted a systematic review and meta-analysis to critically appraise published literature evaluating use of enhanced monitoring tools for postoperative management of patients with OSA.

Methods: A comprehensive literature search was conducted across multiple databases from inception to October 11, 2024. Studies published in English, including adult patients undergoing non-cardiac surgeries that evaluated postoperative monitoring strategies for OSA were included. Interventions included enhanced monitoring tools, including oximetry, end-tidal CO₂ (ETCO₂), transcutaneous CO₂ (TcCO₂), minute ventilation, or telemetry. Risk of bias (RoB) was assessed

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using Cochrane RoB-2 and ROBINS-I tools. Data was pooled using a random effects model to generate odds ratios, mean differences and 95% confidence intervals. Random effects meta-regression with Knapp Hartung correction was done, wherever applicable. Certainty of evidence, and strength of recommendations followed the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach.³

Results: The search retrieved 18638 articles, with 20 observational cohort studies, involving 11,327 patients. Enhanced monitoring tools used included oximetry (n=14), TcCO₂ (n=1), EtCO₂ (n=4), Telemetry (n=2), Vital Signs (n=1), and Minute Ventilation (n=3). RoB was low for the majority. Use of enhanced monitoring was associated with prolonged post-anesthesia care unit (PACU)/ hospital length of stay and change in postoperative disposition. Multi-variable meta-regression identified OSA high-risk status, after adjusting for type of monitoring used. Quality of evidence was low certainty, and was downgraded for observational study design, inconsistency, and imprecision.

Conclusion: We suggest that enhanced postoperative monitoring be considered for patients with OSA experiencing recurrent PACU events (*Low certainty, conditional for recommendation*). Given the high likelihood of postoperative complications in these patients, consideration should be given to early escalation of care, such as initiation of treatment and alternate discharge disposition, particularly with cost and resource constraints and unavailability of enhanced monitoring technologies.

Submission Category | Cat gorie de soumission

Dental and surgical sleep medicine | M decine dentaire et chirurgicale du sommeil

213 A comprehensive maternal sleep analysis in class 3 BMI patients as a predictor for obstetrical complications.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | R sum 

Introduction: The prevalence of obstructive sleep apnea (OSA) increases as pregnancy progresses due to hormonal, metabolic, weight, and physical changes. The association between OSA and obstetric complications, such as pre-eclampsia, fetal growth restriction, and delivery issues, remains under investigation and mainly use actigraphy and questionnaires. This study aimed to conduct comprehensive polysomnography (PSG) to assess sleep quality and explore potential correlations with obstetric complications. **Methods:** This retrospective study was conducted at an

In the abstract list, the presenting author is underlined. In the author index, abstract numbers are underlined indicating presenting authors.

obesity in pregnancy clinic. Patients scoring ≥ 3 on the STOP-BANG questionnaire were routinely referred for PSG to evaluate OSA. Baseline characteristics, pregnancy, labor and PSG data were collected and analyzed according to OSA severity, based on total and REM apnea-hypopnea index (AHI) scores. Results: A total of 114 patients screened positive for OSA, with 46 completing PSG. Three participants had two pregnancies during the study period. Baseline characteristics were similar between those who completed PSG and those who did not. In the cohort, 26% had gestational diabetes, 18% had type 2 diabetes, 15% had chronic hypertension, 19% had pregnancy-induced hypertension, 9% developed pre-eclampsia (PET), and 5% experienced eclampsia or superimposed PET. Among PSG participants, 76% had OSA, with 26% classified as severe. Severe OSA correlated with longer sleep periods below 90% oxygen saturation (16.5% vs. 4.1%; AHI ≥ 30 vs. <30 ; $p < 0.001$). REM OSA was associated with higher HgbA1c (5.2 vs 5.7, $p = 0.03$) and ferritin (28.2 vs 52, $p = 0.046$) levels. Discussion: This cohort demonstrated a substantially higher prevalence of pregnancy-related hypertension and diabetes compared to previous reports in obese pregnant populations. Although OSA severity only partially correlated with adverse outcomes, the findings suggest that OSA screening may aid in risk stratification for pregnant patients, regardless of obesity status. Further research is warranted.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

214 The Perinatal Effects of a Mindfulness Phone App - a Pilot Randomized Controlled Trial

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Objective

Sleep disturbances are commonly reported during pregnancy, are difficult to treat and are associated with adverse perinatal outcomes. We aimed to assess the feasibility of the use of a mobile mindfulness application (App) in pregnant people with self-reported sleep disturbance to improve sleep quality and perinatal outcomes.

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Study Design

Pilot randomized controlled trial (RCT). Pregnant people with a singleton pregnancy, between 20-30 weeks gestation and self-reporting sleep disturbances were assessed for recruitment. Participants were randomized to either the use of a standard pregnancy sleep leaflet or to the addition of funded access to a commercially available mindfulness App. Both groups received and were instructed to use a sleep actigraph. The co-primary outcomes were: 1) recruitment rate and quantitative use of the mindfulness app. 2) Sleep quality actigraph measures and the change in PSQI score. Perinatal outcomes were collected and reported. Sleep parameters and questionnaires were also compared as-treated between App users and non App users subgroups.

Results

Of 1576 potential participants, 128 were randomized (64 per group) after declines and exclusions. Baseline characteristics did not differ between groups by intention-to-treat or as-treated analysis. In the mindfulness group, 35/64 (54.7%) used the app for an average of 9.9 (0.02-90) minutes/day and 8 (1-47) sessions per pregnancy. Actigraph use was similar, with 30/64 (46.9%) and 32/64 (50%) providing data in the mindfulness and control groups. Improvement in actigraphy-measured "Alertness" (85.89 vs 91.65 $p=0.023$) and sleep quality as per PSQI questionnaire (-1.94, $p=0.005$) in the mindfulness App users subgroup.

Conclusion

Conducting an RCT with a mindfulness app is feasible but faces compliance challenges. The observed objective and subjective sleep improvements with mindfulness App use in our cohort warrant further investigation and underscore the need for obstetricians to be mindful of sleep quality during pregnancy.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

215 Association between Bedtime Screen Use and Sleep Health among Adults in Canada

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: A 2024 National Sleep Foundation consensus statement reported that there is not enough scientific evidence to conclude that bedtime screen use can impair adult sleep health.

Objective: Verify if bedtime screen use is associated with sleep health and if this association varies by biological sex, age, and income among adults in Canada.

Methods: Data are from a national stratified random population-based phone interview on sleep health among adults (≥ 18 years) from Canada. Bedtime screen use (in bed or within 1 hour of bedtime) of the past month was self-reported. Sleep health was measured using the RU-SATED (regularity, satisfaction, alertness, timing, efficiency, and duration) questionnaire. Post-stratified survey weights were computed from the 2021 Canadian census to ensure representativeness of the Canadian adult population in terms of geography, biological sex, age, and ethnicity.

Results: The sample included 1,342 adults (51.5% females; 41.7% between 40-64 years) and 45.3% reported bedtime screen use every day. Bedtime screen use $< \text{once/week}$ was associated with better sleep regularity (4.09 ± 0.07) and satisfaction (3.64 ± 0.08). Bedtime screen use frequency was associated with sleep timing and alertness, but the best timing and alertness scores were in both those with the lowest (timing: 4.07 ± 0.08 , alertness: 3.42 ± 0.09) and the highest (timing: 4.19 ± 0.04 , alertness: 3.61 ± 0.05) bedtime screen use frequency. When accounting for demographic variables, there was no association between bedtime screen use and sleep duration or efficiency.

Conclusion: The association between bedtime screen use and sleep health appears complex. Less frequent bedtime screen use was associated with better sleep regularity and satisfaction, but the highest frequency of bedtime screen use was also associated with better sleep timing and daytime alertness. These associations varied by biological sex, age, and income. More research is needed to understand the sleep health and bedtime screen use relationship in adults.

Submission Category | Catégorie de soumission

Sleep health | Santé du sommeil

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216 Age-Dependency of the Correlation between Circannual Day Length and Severe Seizures in the Canadian Arctic

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction

Recent work at Earth's extreme poles in the northern and southern hemispheres has shown a significant correlation between increasing day length (i.e. solar time and severe seizures across the year with higher frequency during months of increasing day length). Age-wise, however, epilepsy prevalence is bimodal, peaking once in younger life and again in later life. It remains unknown whether the correlation between day length and seizure occurrence is uniform across the lifespan.

Methods

Secondary analysis of circannual severe seizure frequency from the Canadian Arctic (Kivalliq, Nunavut) in 2009-2020 (n=117) dichotomized by age. Rayleigh's test was conducted to assess for a statistically significant departure from circular uniformity (e.g. representing equal likelihood occurrence throughout the year) for each age group (e.g. older vs. younger than x-years-old) at each site, over different dichotomized age thresholds (x=30, 35, 40, 45).

Results

There was a significant correlation between increasing day length and severe seizure occurrence for the "younger" age group at the 30, 35, 40, and 45-year-old age thresholds. The respective mean resultant lengths were 0.33 (p=0.018), 0.31 (p=0.012), 0.25 (p=0.028), and 0.24 (p=0.022) averaging calendar directions from April 8-15. In contrast, there were no significant correlations in the "older" age group.

Conclusion

In Kivalliq, Nunavut, there were significant and reproducible correlations of severe seizures with increasing day length after the winter solstice in the younger patient cohorts. In contrast, these correlations were lost in older patient cohorts. These findings demonstrate an inverse age-dependent increase in the circannual link between day length exposure and severe seizures, which may suggest that environmental influences on seizure expression are stronger in younger individuals but degrade with age; for example, possibly from selective degeneration of retino-

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geniculo-hypothalamic afferents reportedly more attuned to zeitgebers from twilight, moonlight, and the seasons.

Submission Category | Cat gorie de soumission

Basic science of sleep and circadian rhythms | Science fondamentale du sommeil et des rythmes circadiens

218 Brain morphology in central disorders of hypersomnolence: First results from the global multi-site neuroimaging consortium NICHY

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | R sum 

Central disorders of hypersomnolence are neurological sleep disorders marked by excessive daytime sleepiness. The neural correlates of narcolepsy type 1 (NT1), type 2 (NT2), and idiopathic hypersomnia (IH) remain unclear due to limited cross-disorder comparisons, small samples, and

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inconsistent methodologies. The NeuroImaging Consortium on HYpersomnolence (NICHY) addresses these issues by pooling datasets and conducting large-scale harmonized analyses. Here, we present preliminary findings from the consortium's first brain morphology study.

T1-weighted MRI scans and clinical data were collected from three sites with matched samples: 40 NT1, 20 NT2, 37 IH, and 38 controls (HC). FreeSurfer was used to evaluate cortical thickness (68 ROIs) and subcortical volumes (64 ROIs). Quality assessment included visual inspection and outlier detection. ComBat corrected for site effects, and statistical models adjusted for age, sex, and ICV, with significance determined via FDR correction.

Subcortically, we identified a smaller left amygdala in NT1 and IH compared to HC. People with NT1 compared to HC, showed thinner cortex in the frontal lobe (bilateral: precentral; right: part opercularis, superior frontal), parietal lobe (left: superior parietal; right: postcentral, posterior cingulate, precuneus), temporal lobe (right: inferior temporal), and occipital lobe (left: pericalcarine; right: lateral occipital). NT2 in relation to HC did not show significant differences. For NT1 compared with NT2, we found thinner cortex in the frontal (right: precentral, superior frontal) and temporal lobes (right: inferior temporal). We identified a larger left anterior-superior hypothalamus in NT1 and NT2 compared to IH, and thinner cortex in NT1 versus IH in frontal regions.

We showed successful application of our harmonised processing pipelines and site correction. This preliminary analysis shapes the planned investigation in the strongly powered dataset of the full NICHY consortium, where we aim to further explore the relation between morphometry and clinical measures such as disease duration, medication, and disease severity.

Submission Category | Catégorie de soumission

Sleep apnea and central disorders of hypersomnolence | Apnée du sommeil et troubles centraux d'hypersomnolence

219 Relation of Cheyne-Stokes respiratory cycle characteristics to oxygen homeostasis and heart failure severity in ADVENT-HF trial participants with central sleep apnea.

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background: In patients with heart failure (HF), Cheyne-Stokes respiration (CSR) cycle length (CL) increases overnight and is inversely proportional to cardiac output. We hypothesized that because the overnight increase in CL could worsen oxygen-desaturation, respiratory compensation will maintain oxygen homeostasis and patients with longer CL will have worse HF than those with shorter CL.

Methods: In all 198 participants with HF and CSR, we determined CL from the start of one apnea to the start of the next plus apnea length (AL) and their mean values for the first and last 10 cycles as well as overall mean for all 20 cycles. We divided them into short and long CL groups based on median overall CL. We compared CSR-related variables between first and second halves of the night and clinical characteristics between the overall short and long CL groups.

Results: Although CL and AL were longer in the second half of the night (54.3 ± 15.8 vs 59.1 ± 16.6 sec, $p < 0.0001$, and 24.5 ± 6.9 vs 27.5 ± 8.8 sec, $p < 0.0001$, respectively), there was no change in mean oxygen saturation (SaO_2) (92.9 ± 2.5 vs $92.8 \pm 2.7\%$, $p = 0.56$) in association with an increase in the number of breaths during hyperpnea (9.2 ± 3.8 vs 9.8 ± 3.7 breaths, respectively, $p < 0.0001$). Lung-to-finger circulation time, inversely proportional to cardiac output, correlated significantly with overall mean CL and AL. Patients with longer CL were older, had lower LVEF and diastolic blood pressure, higher NT-proBNP, more severe mitral regurgitation and higher rates of atrial fibrillation/flutter and ICD implantation than those with shorter CL.

Conclusions: In patients with HF and CSA, although the increase in AL in the second half of the night should lead to greater oxygen desaturation, a compensatory increase in breaths/hyperpnea maintained mean SaO_2 constant. CSR cycle characteristics are related to HF severity: longer CL is associated with worse HF than shorter CL.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

225 Intensive sleep retraining and total sleep deprivation for treating chronic insomnia: A randomized controlled trial

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

The aim of the study was to compare the efficacy of intensive sleep retraining (ISR) and total sleep deprivation (TSD) against a no-treatment control condition for treating chronic insomnia and examine two potential mechanisms: the resolution of conditioned insomnia and the increase in homeostatic sleep drive produced by sleep deprivation. Thirty-four adults with chronic sleep onset insomnia were randomized to ISR, TSD or a control condition. The ISR condition consisted of a 38.5-hour period of sleep deprivation, the last 21 hours of which included 42 sleep onset trials, the TSD condition consisted of an equivalent 38.5-hour sleep deprivation period without any sleep onset trials, and the control condition consisted of one night of habitual sleep in the laboratory. Treatment outcomes were assessed with daily sleep diary, actigraphy, the Insomnia Severity Index and questionnaires evaluating fatigue, anxiety and depressive symptoms. Significant decreases in insomnia severity were observed from pre- to post-treatment in both ISR and TSD, but not in the control condition. A significant reduction in sleep onset latency was observed during the same period for the ISR condition, but not for the TSD or control conditions, with no significant change in anxiety or depressive symptoms. Significant decreases in fatigue were also observed for both ISR and TSD conditions during the same period. These results were generally maintained up to 3 months after treatment. Sleep improvements produced by ISR, and to a lesser extent by TSD, suggest that both the resolution of conditioned insomnia and the increase in homeostatic sleep drive represent important mechanisms responsible for the efficacy of ISR.

Submission Category | Catégorie de soumission

Insomnia | Insomnie

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228 Maternal sleep fragmentation and pregnancy outcomes in pregnancies affected by obesity

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background:

Sleep fragmentation, characterized by frequent arousals interrupting sleep continuity, is common in pregnancy, with obstructive sleep apnea (OSA) being more prevalent. Late pregnancy and the postpartum period are also associated with shorter, lighter, and less efficient sleep. This study aimed to assess sleep architecture and fragmentation in pregnant patients using in-lab polysomnography (PSG) and explore associations with obstetrical outcomes.

Methods:

This retrospective study was conducted at an obesity in pregnancy clinic. Patients with a STOP-BANG score ≥ 3 were referred for PSG to evaluate OSA. Data on baseline characteristics, pregnancy, labor, and PSG results were analyzed based on total arousal index (TAI) severity.

Results:

Of 114 patients screening positive for OSA, 46 completed PSG. Three patients had two pregnancies during the study. Baseline characteristics were similar between patients who completed PSG and those who did not. Among the cohort, 26% had gestational diabetes, 18% had type 2 diabetes, 15% had chronic hypertension, 19% had pregnancy-induced hypertension, 9% developed pre-eclampsia, and 5% experienced eclampsia or superimposed pre-eclampsia, Much higher than in the obese pregnant population.

In the PSG group, the mean TAI was 38.9 (SD 27.7), respiratory arousal index (RAI) was 17.5 (SD 26.0), and non-RAI was 22.6 (SD 8.1). Limb movement index (LMI) >5 was observed in 70%, with 25% having LMI >15 . Patients with TAI ≥ 30 had significantly higher first-trimester HgbA1c (5.2 vs. 5.7, $p=0.008$), hemoglobin (110.2 vs. 118.1, $p=0.013$), ferritin (38.4 vs. 52.6, $p=0.023$), and T90 (4.4 vs. 9.7, $p=0.027$) compared to TAI <30 . No differences were observed in MCV levels.

Conclusions:

This study highlights significant sleep disruption in pregnancy and its potential impact on obstetrical outcomes, emphasizing the need for further research in broader pregnant populations.

Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

231 The relationship between sleep and neurocognition in pediatric stroke

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Background: Pediatric arterial ischemic stroke (AIS) has a significant impact on neurological function, including motor and cognitive deficits. Cognitive deficits are present in 67% of children and are related to factors beyond the stroke lesion. Children with AIS may have abnormal sleep health even in the absence of obstructive sleep apnea (OSA). The relationship between measures of sleep and neurocognitive (cortical and non-cortical) impairment in children with AIS remains unknown. Thus, we aimed to evaluate sleep and neurocognition in children with AIS.

Methods: We conducted a cross-sectional study of sleep health and neurocognitive outcomes in children with AIS aged 8-18 years old. All participants were assessed with the pediatric sleep questionnaire (PSQ), overnight polysomnography (PSG), magnetic resonance imaging (MRI), and neurocognitive assessment of intellectual abilities, executive function, and symptoms of inattention and hyperactivity.

Results: Overall, 25 children with AIS and high-risk of AIS [88% (n=22) AIS; 52% female; median age at assessment: 12.5 years, range 8-18 years], with the median age at stroke of 3.5 years were included in the study. PSQ scores were significantly correlated to measures of executive functioning, inattention, and hyperactivity indices ($r = 0.62$, $r = 0.48$, and $r = 0.59$, respectively, $p < 0.05$) and further, children with a PSQ > 0.33 differed significantly from those with a PSQ of < 0.33 . Mean SpO₂ from PSG during sleep were moderately correlated to scores of executive functioning ($r = -0.49$, $p = 0.06$) and significantly correlated to scores of hyperactivity ($r = -0.60$, $p < 0.05$).

Conclusion: The presence of OSA is associated with non-cortical cognitive impairments (executive dysfunction, inattention, and hyperactivity) not explained by the stroke lesion in patients with AIS. Low oxygenation during sleep likely plays an important role in this association. Further investigation is needed to understand the mechanism through which sleep affects neurocognition.

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Submission Category | Catégorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

235 COVID-19 Stress and Family Well-Being: The Role of Sleep in Mental Health Outcomes for Parents and Children

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: The COVID-19 pandemic introduced various stressors for families, including changes to daily routines, work, and schooling. Studies linked these stressors to increased mental health challenges for parents and children. In addition, sleep difficulties were common during the pandemic, with some children and parents experiencing poorer sleep quality and shorter sleep duration. However, it remains unclear whether COVID-19 stress impacts child and/or parent sleep, and whether these sleep disruptions contribute to mental health challenges in both groups.

Method and Results: This study examined the impact of COVID-19 stress on sleep and mental health difficulties in school-aged children (ages 5-11) and their parents in Canada and the United States. N=961 parents completed validated measures of COVID-19 stress, and of their own and their child's sleep and mental health. The direct and indirect effects of COVID-19 stress on mental health outcomes were tested using path analysis, with sleep problems as a potential mediator. Results revealed child and parent sleep problems mediated the relationships between COVID-19 stress and mental health outcomes. Specifically, child sleep problems mediated COVID-19 stress effects on both child ($\beta = 0.20$) and parent ($\beta = 0.33$) mental health difficulties, while parent sleep problems contributed significantly but to a lesser degree (parent mental health: $\beta = 0.07$; child mental health: $\beta = 0.03$). Results also revealed significant direct effects of COVID-19 stress on both child and parent mental health difficulties that were not mediated through sleep difficulties.

Conclusion: Results underscore the interconnected nature of sleep and mental health, demonstrating that stress-related disruptions in sleep (particularly children's sleep) can exacerbate mental health difficulties for parents and children during crises like the COVID-19 pandemic. Therefore, addressing child and parent sleep difficulties could be a critical component of interventions aimed at mitigating adverse mental health impacts of future global crises.

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Submission Category | Catéorie de soumission

Sleep and medical conditions (including COVID-19) | Sommeil et conditions médicales (incluant COVID-19)

236 Development of a Trust-Building Research Framework to Address Sleep Health Disparities Among People Experiencing Homelessness (PEH)

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: Sleep health disparities disproportionately affect people experiencing homelessness (PEH), a population facing significant barriers to accessing timely and effective healthcare. Environmental factors, systemic inequities, and distrust in healthcare systems exacerbate these challenges, leading to poor sleep outcomes and limited healthcare access.

Objective: To co-develop and co-implement a culturally responsive framework for sleep care that addresses systemic inequities and promotes equitable healthcare delivery for PEH.

Methods: This study was conducted across seven shelters in Toronto, Canada, using a trauma-informed, patient-centered participatory action research (PAR) approach. Portable polysomnography was used to assess sleep apnea prevalence, while qualitative methods identified barriers and systemic inequities. Collaboration with a community advisory group, including individuals with lived experience, Indigenous knowledge holders, and shelter staff, informed the development of the framework.

Results: A Trust-Building Framework for Sleep Health Disparities was developed, encompassing six steps: Readiness, Engagement, Data Collection, Analysis, Implementation, and Evaluation. This framework addresses trust, systemic inequities, and cultural responsiveness to improve sleep health outcomes among PEH. Specific elements include: training on trauma-informed care and cultural competency, identifying systemic barriers to sleep health, and building trust-based relationships with stakeholders, including individuals with lived experience, shelter staff, and healthcare providers. Quantitative tools (e.g., portable polysomnography, STOP-BANG) and qualitative methods (e.g., interviews, focus groups) were integrated to assess barriers and unmet needs. Collaborative data interpretation informed tailored interventions such as CPAP devices, mental health supports, and culturally adapted educational materials. Outcomes were assessed

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through participant feedback, knowledge-sharing workshops, and monitoring sustainable integration of practices.

Conclusion: The Trust-Building Framework for Sleep Health Disparities integrates culturally responsive, community-driven solutions into shelter-based healthcare systems. By centering participant voices and fostering interdisciplinary collaboration, this initiative promotes health equity and improved sleep outcomes for underserved populations.

Keywords: Sleep health disparities, homelessness, trauma-informed care, participatory action research, culturally responsive frameworks.

Submission Category | Catégorie de soumission

Sleep equity | Équité face au sommeil

240 Inducing lucid dreaming with multisensory stimulation in REM sleep: a multi-center study

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Lucid dreaming is a state of consciousness where one is aware of dreaming while asleep. While lucid dreaming can occur spontaneously, it remains rare. Prior studies attempting to induce lucid dreaming are often limited to small sample sizes and expert lucid dreamers, reducing generalizability. In this multi-center study, we test a novel approach combining two induction methods: targeted lucidity reactivation (TLR) and sense-initiated lucid dreaming (SSILD), in a large sample of participants with varying lucid dream experience.

A total of 60 participants (33 F; 26.2±6.2 yrs old) from Canada, Italy and the Netherlands, spent two morning naps in the laboratory. Sleep was recorded with a wearable headband (Zmax) and the open-source Dreamento toolbox. Participants completed pre-sleep SSILD training cycling their

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attention to their senses with associated auditory, visual and tactile cues. Cues were then reintroduced in REM sleep (TLR method), with stimulation and sham conditions counterbalanced. Lucid dreaming and cue perception during sleep were confirmed using an intentional eye movement signal from within the dream.

We successfully induced at least one signal-verified lucid dream (SVLD) in 31 participants (51.7%). Self-reported lucid dreams occurred in 63 naps (52.5%) – of these, 40 were SVLDs, including 24 (40%) in the stimulation condition and 16 (26.7%) in the sham condition (no difference between conditions, $p=.153$). In the stimulation condition, 15 SVLDs (62.5%) were initiated by perceiving cues from within the dream (10 visual, 2 auditory, 3 vibration).

Our cognitive and sensory induction method led to high rates of lucid dreaming. While cues were at times successfully perceived within the dream as lucidity signals, our results do not show a clear additional benefit of REM cueing compared to cognitive training alone. Further developing robust techniques for inducing lucid dreams could contribute to nightmare therapy and enhance insights into the fundamental mechanisms of sleep, dreaming and consciousness.

Submission Category | Catégorie de soumission

Sleep, dreams and mental health | Sommeil, rêves et santé mentale

242 Recovery sleep after intensive sleep retraining and total sleep deprivation in adults with chronic insomnia

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Study objective: To compare recovery sleep over a 2-week period after undergoing intensive sleep retraining (ISR), total sleep deprivation (TSD), or a no-treatment control in adults with chronic insomnia.

Participants: Thirty-four unmedicated adults with chronic sleep onset were recruited from the community.

Interventions: Participants were randomized to ISR, TSD or a control condition. The ISR treatment consisted of 42 sleep onset trials over a 21-hour sleep deprivation period, the TSD treatment consisted of an equivalent 21-hour sleep deprivation period without sleep onset trials, and the control condition consisted of one night of habitual sleep in the laboratory.

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Measures: Daily sleep diary and actigraphy measures of total sleep duration and sleep continuity parameters (sleep onset latency, wake after sleep onset, sleep efficiency) monitored during a 2-week baseline period and a 2-week post-treatment period.

Results: Mixed model analyses on daily data revealed significant increases in total sleep time from baseline to day 1 post-treatment in ISR, TSD and control conditions. Significant increases in sleep efficiency were observed in both ISR and TSD, but not in the control condition. Sleep onset latency, wake after sleep onset, and sleep quality were significantly improved during the same period for both ISR and TSD conditions. At day 2 post-treatment, total sleep time remained significantly improved for ISR, but not in the TSD or control conditions. Beginning at day 3 up to day 14 post-treatment, no notable changes were observed in any of the conditions.

Conclusion: Sleep recovery following ISR and TSD is characterized by important sleep improvements on the first day post-treatment, followed by a rapid decline on the second day and no notable change afterward. The rebound effect is less pronounced for ISR than TSD condition, with similar reported sleep quality, suggesting that ISR may offer better therapeutic potential.

Submission Category | Cat gorie de soumission

Insomnia | Insomnie

243 Sleep Apnea Prevalence in People Experiencing Homelessness

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | R sum 

Introduction: People with unstable housing experience excessive fatigue, and are more likely to use substances to fall asleep at night. A potential cause of poor sleep is sleep apnea, which is characterized by repeated obstruction of the pharyngeal airway during sleep. Though 85% of

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shelter residents have a comorbid condition of sleep apnea, such as hypertension, depression, and substance use, there are no objective measurements of sleep apnea in this population.

Objective: We aim to determine the prevalence of sleep apnea among shelter residents using portable polysomnography at shelter.

Method: We have worked closely with a group of people with lived experience of homelessness and sleep apnea to run the study and build a trustful relationship with shelter residents. A research assistant and a person with lived experience attended the shelter at night. Afterwards, anthropometric data such as height, weight, neck circumference, and blood pressure were collected. Then, participants were instrumented with a portable level-II polysomnography device for sleep assessment. Sleep apnea severity was also defined by apnea-hypopnea index (AHI).

Results: We have recruited 46 residents from five shelters who consented to participate in the study. Four participants showed no sleep apnea symptoms (AHI<5 events/hour). Our analysis showed that 57% of the participants (24 out of 46) had moderate-to-severe sleep apnea (AHI>15 events/hour; refer to Table 1 for more information). The arousal index was very high in participants, which could contribute to daytime sleepiness and poor quality of life in PEH.

Conclusion: This is the first study to show a high moderate-to-severe prevalence of sleep apnea (57%) in shelter residents. Given the high prevalence of chronic conditions in shelter residents, healthcare policymakers and physicians should consider sleep apnea a modifiable cause of mortality and poor quality of life in shelter residents and provide more accessible and equitable sleep care to shelter residents.

Submission Category | Catégorie de soumission

Sleep equity | Équité face au sommeil

244 Nocturnal SpO₂ in Long COVID: A preliminary observational facility-based study

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

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Abstract | Résumé

Introduction Persistent post-acute sequelae of SARS-CoV-2, i.e., long COVID, is a heterogeneous syndrome involving multiple organ systems. It is known that ventilation and blood oxygen are more vulnerable during sleep, but nocturnal hypoxemia has not been studied in long COVID in a facility setting using polysomnography (PSG). Here, we characterized blood oxygen levels during sleep.

Methods This was an observational study with 50 participants (25 long COVID, 25 age-sex-matched healthy controls) using in-laboratory overnight PSG. The controls were a convenience sample of past healthy participants. We calculated the average SpO₂, average SpO₂ after removing desaturations, hypoxic burden using all desaturations, and respiratory rate. We studied these metrics in different sleep periods and stages. We adjusted for body mass index since it is negatively associated with SpO₂. We used the Bonferroni multiple tests correction.

Results The average SpO₂ was lower in long COVID: 1.0% lower after sleep onset until lights on ($p = 0.004$) and 0.7% lower during REM ($p = 0.002$); average SpO₂ after removing desaturations was also lower in long COVID: 1.3% lower after sleep onset until lights on ($p = 0.002$), 0.9% lower during REM ($p = 0.0004$), and 1.4% lower during NREM ($p = 0.003$); and respiratory rate was 1.4/minute higher in long COVID during REM ($p = 0.005$). Hypoxic burden showed no difference.

Conclusion The results suggested that patients with long COVID have a persistent lower nocturnal blood oxygen saturation. The preliminary findings highlight the need for further research to better understand how long COVID affects sleep and health.

Support This research was supported in part by funding from the Open Medicine Foundation and Patient-Led Collaborative (JMM), NIH/NHLBI R01HL136310, and NIH/NINDS R21NS128815 (MH). Dr. Westover is a co-founder, scientific advisor and consultant to, and has a personal equity interest in, Beacon Biosignals.

Submission Category | Catégorie de soumission

Novel technologies for sleep assessment and interventions (wearables, AI, digital health, signal analysis algorithm, etc.) | Nouvelles technologies pour l'évaluation et les interventions en matière de sommeil (wearables, IA, santé numérique, algorithme d'analyse des signaux, etc.)

245 Investigating Barriers to Sleep Apnea Diagnosis and Treatment for People Experiencing Homelessness

Mr. Parker McLaurin¹, Mr. Behrad TaghiBeyglou², Ms. Papina Gnanewaran³, Ms. Oviga Yasokaran¹, Ms. Marisol Campos Navarrete³, Dr. Majida Mohammad³, Ms. Rene Adams³, Dr. Najib Ayas⁴, Ms. Sachin Pendharkar³, Dr. Fernanda Almeida⁴, Dr. Mandeep Singh³, Dr. Azadeh Yadollahi³, Dr. Valeria Rac³

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction: People with unstable housing experience excessive fatigue and are more likely to use substances to fall asleep at night. A potential cause of poor sleep is sleep apnea, which is characterized by repeated obstruction of the pharyngeal airway during sleep. Though 85% of shelter residents have a comorbid condition of sleep apnea, such as hypertension, depression, and substance use, people experiencing homelessness have many barriers to access sleep care.

Objective: We aim to identify the barriers to care and treatment of sleep disorders in a shelter environment from the point of view of shelter staff.

Method: We have worked closely with a group of people that work within the shelter environment as staff members to discuss barriers to care and treatment. Three surveys were administered, one on diagnosis of sleep disorders in the shelter environment, one on treatment of sleep disorders in a shelter environment and finally one on the principles of compassionate care as presented in a shelter environment.

Results: We have recruited 5 members of different shelters across the City of Toronto, who consented to participate in the study. Based on the interviews, for sleep apnea diagnosis, the appropriateness of diagnostic devices within the shelter environment, such as portable polysomnography or attending sleep laboratory, depends on the individual, and the type of shelter environment. For treatment, the limitations of the shelter environment, namely access to electrical outlet and noise, treatment options beyond CPAP like oral appliances may be more appropriate. Providing compassionate care, with emphasis on communication and understanding is a critical part of successfully providing medical services to individuals in a shelter environment, and without it medical intervention is much more difficult.

Discussion: Policies to improve access to sleep apnea diagnosis and more user-centered options for treatment of sleep apnea are necessary to remove barriers to sleep care among shelter residents.

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Submission Category | Catégorie de soumission

Sleep equity | Équité face au sommeil

246 ‘Aura’ in Kleine-Levin Syndrome (KLS): a case report

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ORAL SESSION AND POSTER ASSIGNMENTS

POSTER SESSION 2

Abstract | Résumé

Introduction

Kleine-Levin Syndrome (KLS) is a rare condition characterized by discrete episodes of hypersomnia with cognitive and behavioural changes. Events typically have an abrupt onset and last from days to weeks before typically returning to an asymptomatic baseline. Following onset, relapses tend to occur every few months for several years, often resolving in the third or fourth decade. Triggers for relapsing episodes include infection, alcohol, sleep deprivation, and excessive stress, though events are often unpredictable and occur without a clear trigger. The identification of warning signs of an impending episode would be beneficial, allowing for early intervention.

Report of Case

We report the case of a 20-year-old male with KLS, with 8 lifetime episodes over four years. Investigations informing the diagnosis included bloodwork, EEG, MRI, CSF analysis, and PSG. Episodes consisted of severe hypersomnolence, cognitive impairment, derealization, altered appetite, apathy, and impaired temperature perception. He reported mental status changes of minutes to hours preceding each episode with disorientation to time, poor day-night differentiation, and an urge to sleep. He also experienced such ‘aura’-like sensations several times not followed by frank episodes. He described the subjective experience of diverting potential episodes by making deliberate efforts to re-orient himself to time using external cues, eschewing the urge towards extended sleep, and avoiding potential triggers.

Conclusions

Patients experiencing acute episodes of KLS are at risk of physical and psychological harms stemming from the cognitive and behavioural changes. To date, we are not aware of ‘early’ signs or symptoms in the literature heralding the onset of an episode, though one prior study did describe ‘mini-episodes’ which could self-terminate. Some patients with KLS may have an ‘aura’-like

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experience prior to developing a full episode. This could represent a window for early intervention to reduce the risks to the patient during these periods.

Submission Category | Catégorie de soumission

Parasomnias | Parasomnies

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