

findings on DISE contributed to surgical planning for the patients in our centre.

Conclusions: In our study, drug induced sleep endoscopy recorded substantially higher levels of airway collapse as compared to assessment using awake nasoendoscopy with Müller's manoeuvre. The review of our DISE cases revealed the commonest site of airway collapse to be the velum followed by the tongue base in our local population. DISE enhanced our practice by guiding surgery and clinical outcomes in several cases.

Basic Research

PREVALENCE OF SNORING AND OBSTRUCTIVE SLEEP APNEA AND THEIR RELATIONS WITH DOCTOR DIAGNOSED NCDs OF AN ADULT URBAN POPULATION IN WEST BENGAL, INDIA: AN INTERIM REPORT

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Introduction: Barrackpore Health Study, a longitudinal study conducted general health including snoring and demographic questionnaire survey 2001 and 2011 of randomly selected 3030 households of Barrackpore, West Bengal, India. Both survey results show increased risk of Doctor Diagnosed (DD) NCDs among Snorers (SN) compared to Non-snorers (NSN), presented in the ASRS Congress 2014 India, abstract 86. Hence the study embarked on for objective evidence of prevalence of:

1. OSA and its relationship with snoring history.
2. Associations of each with DD-NCDs.

Materials and methods: In the ongoing cross-sectional study, 432 adults (18–70 yrs.) were assessed between February 2016 – April 2017. The current report considered Hypertension, Diabetes and Body Mass Index (BMI) as DD-NCDs. For OSA symptoms and sleep health Wisconsin sleep questionnaire was used. Apnea Link Plus used to assess OSA. For OSA gradation International classification of Apnea-Hypopnea Index (AHI) is used.

Results: 46.53% male and 53.47% female. OSA 215 (49.77%), 29% with AHI ≥ 15 AHI. Snorers 200 (46.30%), OSA with snorers 135 (31.19%), OSA with non-snorers 80 (18.52%), non-snorers with no OSA 152 (35.19%), snorers with no OSA 65 (15.05%).

About 50% of the male and a little less than 50% of the female participants were snorers. 70% male snorer and 65% female snorer had OSA. 33.83% male mild OSA, 36.17% female with mild OSA. Higher proportion of male had moderate (11.94%) and severe OSA (8.46%) than female. Compare to non-snores with no OSA, non-snorers with OSA [AOR=2.01, 95% CI: 1.11, 3.62, $p=0.0217$] were associated with DD-Hypertension. Snorers with OSA were associated with DD-Hypertension [AOR=2.84, 95% CI: 1.71, 4.71, $p<.0001$] and DD-Diabetes [AOR=2.33, 95% CI: 1.20, 4.50, $p=0.0123$] compare to non-snores with no OSA. Increasing BMI, both overweight and obese group were associated [Overweight: AOR=4.25, 95% CI: 2.45, 7.35, $p<.0001$; Obese: AOR=6.18, 95% CI 2.75, 13.99; $p<.0001$] with snorers with OSA.

Conclusions: Around half of the cohort population has either OSA or snoring. Over two-third with OSA are a snorer, about one out of three non-snorers have OSA. little less than one-third with both OSA and snoring. Little over one third neither OSA nor snoring history. Doctor diagnosed – hypertension, diabetes and BMI are analysed as prevalent NCDs. Numbers and or strength of other NCDs were inadequate.

Prevalence of three DD-NCDs: highest among OSA with snoring, lowest among non OSA and non-snorer groups. Other groups prevalence is in-between. Overall, individuals with OSA (AHI ≥ 15) have increased prevalence compared with mild OSA (AHI < 15) in all the subgroups.

The Present results suggest snoring history isn't a reliable marker of OSA. Beside one-third non-snorer having OSA, one-third of snorers have no OSA. Snorers with no OSA have increased incident NCDs.

Take home: Information from randomized a periodic survey of adequate numbers with validated protocol at acceptable intervals is expected to achieve:

1. The trend of OSA and snoring.
2. The trend of the association between baseline characteristics and incident NCDs including may be temporality.

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Other

ACUTE ENERGY BALANCE ALTERATION MODIFIES SLEEP ORGANIZATION IN HEALTHY MEN

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Introduction: A link between sleep organization and metabolic regulation has been reported but the impact of changes in energy balance on sleep is less understood. We evaluate whether changes in energy balance modulate nighttime sleep organization and the spectral power of sleep.

Materials and methods: We studied a sample of 10 healthy young normal-weight men. They underwent a 5-consecutive nights in-lab protocol, where sleep was measured at baseline (BL, 1st night), after 2 days of Caloric Restriction (CR, 10% of individual energy requirements), and after 2 days of caloric supply restoration by *ad libitum* feeding (AL). Sleep was assessed by PSG and sleep stages scored according to R&K. Spectral power analysis of artifacts-free EEG segments (C4-O1 derivation) was conducted during the first 2 hours after sleep onset. Delta (0.5–4.5 Hz), theta (4.5–8 Hz), alpha (8–12 Hz), sigma (12–15 Hz) and beta (15–25 Hz) power was calculated and compared between BL, CR and AL conditions.

Results: Total sleep time, sleep efficiency, wakefulness, REM sleep or non-REM stages S1 and S2 were similar between conditions. However, S4 time (65.2 \pm 9.0 vs. 82.5 \pm 5.1 min., $p=0.003$) and percentage of TST (16.1 \pm 2.3 vs. 19.7 \pm 1.4 %, $p=0.01$) was increased after 2 nights of CR compared with BL (but similar to AL). Higher delta- (51.3 \pm 1.3 vs. 52.8 \pm 1.2 %, $p=0.05$) but lower beta-power (11.4 \pm 0.6 vs. 9.7 \pm 0.7 %, $p=0.03$) was found after CR compared with AL. Theta-power was lower after AL compared with both BL and CR ($p=0.001$). Alpha or sigma bands were not affected by changes in energy balance.

Conclusions: Acute depletion of energy balance increases the deepest stage of non-REM sleep. Spectral analyses suggest a deepening of the ongoing sleep process after CR, reflected by an increased delta- and reduced beta-power. These findings provide further evidence for a strong connection between energy homeostasis and sleep regulation in humans.

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Other

A SINGLE NIGHT MODERATE SLEEP RESTRICTION AT-HOME INCREASES HUNGER AND CALORIC INTAKE IN YOUNG ADULTS

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Introduction: Experimental studies under laboratory conditions have reported a link between sleep restriction and metabolic homeostasis. We assessed the effect of one-night moderate sleep restriction at-home on sleep patterns and food intake regulation in healthy human participants.

Materials and methods: Participants were part of a cohort follow-up study since infancy. They were assessed in early adulthood for two successive nights: the first night (N1), following their usual sleep routine, and the second one (N2), following a moderate sleep restriction (sleep from 03:00 to 08:00 h). Sleep was recorded at-home by a non-invasive ambulatory system that measures peripheral arterial tonometry through a plethysmographic based finger-mounted probe (Watch-PAT200, Itamar Medical, Israel), placed in the non-dominant wrist. Sleep duration, rapid eye movement sleep (REM), light sleep (LS), deep sleep (DS) and wake were automatically scored. Visual analogue scales (VAS) and 4-consecutive dietary records were used to measure hunger/satiety feelings and daily food intake (daytimes preceding N1 and following N2), respectively. Caloric and macronutrient dietary composition was analysed using specific software for food composition (FoodProcessor SQL[®], USA).

Results: Subjects were 20.8±0.6 yrs., 53% (n=8) males, mean body-mass index 27.5±6.2 kg/m². Sleep and REM latencies, LS time and Wake episodes were similar between nights. Compared with N1, sleep efficiency (83.2±6.6 vs. 78.4±9.4 %, p=0.04) and total sleep time (6.7±0.9 vs. 5.2±0.9 h, p=0.003) were lower. DS was higher (22.3±4.1 vs. 25.5±0.9 %, p=0.05) in N2. After N2, overall rating for hunger (p50-iqr) was higher compared to the daytime after N1 (22.5–16.5 vs. 34.8–17.8 mm, p=0.002), whereas satiety feelings did not differ. All-day caloric intake was higher after N2 (1698.4 ± 538.2 vs. 2272 ± 837.2 Kcal, p=0.007) due to increased amount of fat and proteins (both p< 0.01) but not carbohydrates (p=0.06).

Conclusions: A single night moderate sleep restriction at-home implies altered sleep patterns, increased hunger and caloric intake, the daytime in young adults. Our results provide further support to the role of sleep on food intake regulation in humans.

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Sleep Breathing Disorders

ADENOTONSILLECTOMY FOR MILD OBSTRUCTIVE SLEEP APNOEA IMPROVED ATTENTION IN CHILDREN – A RANDOMISED CONTROLLED STUDY

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Background: The first-line treatment for childhood OSA is adenotonsillectomy (AT). However, there has been no controlled study to evaluate the effectiveness of AT in ameliorating neurocognitive disturbances in children with mild OSA.

Aims and objectives: To compare the effect of early AT versus watchful waiting (WW) on attention in children with mild OSA

Methods: This was an interim analysis of a single-blind randomised controlled trial. The study involved 2 visits with a 7-month intervention period in between. Pre-pubertal non-obese children aged 6–11 years who had mild OSA (obstructive apnoea hypopnoea index (OAH) between 1/h and 5/h) and adenotonsillar hypertrophy were recruited. The subjects were randomly assigned to either early AT group or watchful waiting (WW) group in a 1:1 ratio. The primary outcome of the study was the omission T score in Conners' continuous performance test (CPT), which is an objective measure of attention.

Results: Twenty-five children were randomised into each arm. Four and eight subjects defaulted follow-up visit and were excluded from the AT and WW groups respectively. In the AT group, there was significant improvement in OAH from 2.1/hr (IQR 1.4–3.2) to 1.1/hr (IQR 0.3–2.0) [p=0.035], which was accompanied by a modest but significant improvement in CPT omission T score from 44.7 (IQR 43.0–49.9) to 44 (IQR 42.9–45.3) [p=0.017]. Such improvement was not observed in the WW group.

Conclusions: This interim analysis showed that early AT could lower OSA severity and improve attention in pre-pubertal non-obese children with mild OSA.

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Sleep Breathing Disorders

LIMITATIONS OF THE APNEA-HYPOPNEA INDEX FOR ASSESSING THE CLINICAL SEVERITY OF OBSTRUCTIVE SLEEP APNEA IN CHILDREN

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Introduction: The obstructive apnea-hypopnea index (OAH) is the most widely used measure for the diagnosis and severity assessment of pediatric obstructive sleep apnea (OSA). However, OAH may not map well onto the clinical severity of OSA in children, especially for those with a low or normal OAH.

Materials and methods: We reviewed the medical records of children aged 2 to 13 years who completed a polysomnographic (PSG) examination at the Boston Children's Hospital for evaluation of OSA between January 2012 and June 2014. We assessed the correlation between the overall clinical impression of OSA severity and the numeric OAH severity on the PSG. We identified parameters that significantly correlated with the clinical severity of OSA.

Results: We analyzed 649 sleep studies. In those with a clinical impression of mild OSA, 46.7% had a normal OAH (< 1.5/hour). We found that patients with an OAH< 1.5 were likely to be diagnosed as mild OSA and recommended treatment if at least 2 of the following 4 factors were present: obstructive respiratory disturbance index ≥2; respiratory arousal index ≥1.5; snoring documented during the PSG; and end tidal CO₂ >50 mmHg for >20% of the total sleep time. Patients with a mild OAH category (1.5–4.99) were likely to be recommended treatment as moderate OSA if the nadir O₂ saturation was < 92%.

Conclusions: The OAH is useful but has significant limitations when it is low or normal. In children with an OAH< 1.5, other parameters should be taken into consideration for a prompt diagnosis and treatment of OSA.

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Other

SLEEP INTERVENTIONS IMPROVE SUBJECTIVE SLEEP, MOOD, AND RACE PERFORMANCE IN CANADIAN NATIONAL TEAM SPEED SKATERS

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Introduction: Previous research has shown benefits of sleep optimization for performance in elite athletes. This pilot study focused on evaluating the impact of a sleep optimization program on subjective sleep, mood, and race performance in Canadian National Team speed skaters.

Methods: Seven Canadian National Team long track speed skaters (mean age 24.3 y ± 4.2; 3 females) were enrolled in the study during the 2016–17 World Cup season. The Athlete Sleep Screening Questionnaire (ASSQ) and the Profile of Moods State (POMS) were completed during a baseline phase (BLP) prior to the Canadian World Cup Selections and following a two-week sleep optimization phase (SOP) during the Canadian Single Distance Championships, with both events held in Calgary, AB. The SOP consisted of daily napping, increasing night time sleep, and a bedtime routine which included an electronic device curfew and wearing blue light blocking glasses 2 hours before bedtime. Paired sample t-tests were used to assess