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The associations between PSG metrics of OSA and MACE in the whole cohort and in sub-groups stratified by age-group (< 60 years, ≥60 years), sex, and prevalent CVD were investigated using multivariable-adjusted Cox regression models. Results are presented as hazard ratios (HRs) and 95% confidence intervals (CI).

PSG metrics assessed included apnea-hypopnea index (AHI), time in min spent with oxygen saturation < 90% (T90), oxygen desaturation index 3% and 4% (ODI3, ODI4), and arousal index. Metrics with skewed distribution were $\log_e$-transformed prior to analysis.

Results: The study cohort was middle-aged (50.6 ± 14.0 years), obese (32.7 ± 7.7 kg/m^2), and 60.8% male. Across the cohort, 85.6% ($n = 3{,}815$) were diagnosed with OSA (AHI≥5 events/hr), and 45.1% ($n = 1{,}835$) had severe OSA (AHI ≥ 30 events/hr).

Over a median follow-up of 7.2 years, 14.3% ($n = 582$) developed MACE. After multivariable adjustment for known CVD risk factors, log-transformed PSG metrics of hypoxemia, but not AHI, predicted the development of MACE: T90 (HR, 1.14; 95%CI, 1.00–1.29), ODI3 (HR, 1.34; 95%CI, 1.03–1.75), and ODI4 (HR, 1.27; 95%CI, 1.02–1.59) (all $p < 0.05$). PSG metrics of OSA severity were independently associated with MACE primarily in individuals aged < 60 years, women, and those with prevalent CVD.

Conclusions: In this large prospective sleep clinic cohort, PSG metrics of hypoxemia, but not AHI, were independently predictive of MACE. Analyses by clinical sub-groups suggest that physiological insults related to OSA, as measured by PSG metrics, are more likely to be significantly associated with MACE in middle-aged or younger adults, women, and in those with prior CVD.

Disclosure: Yes

Conflict of Interest statement: Jennifer Walsh and Kathleen Maddison have received research funding from Nyxoah SA and Incannex Healthcare Ltd but have nothing to disclose which is relevant to the content of this abstract. Brendan McQuillan has received honoraria for advisory board participation and education meetings from AstraZeneca and Boehringer Ingelheim Lily. Nigel McArdle has received research funding support within the last year from Nyxoah Pty Ltd (Mont-Saint Guibert, Belgium). All other authors have no conflicts of interest to declare.

O011/P101 | Characterization of paediatric heart rate variability segments based on sleep stage and presence of apnoeic events

A. Martín-Montero[1,2], P. Armañac-Julián[3,2], L. Kheirandish-Gozal[4], E. Gil[3,2], D. Gozal[4], R. Hornero[1,2], G.C. Gutiérrez-Tobal[1,2]

[1]*Biomedical Engineering Group, University of Valladolid, Valladolid, Spain,* [2]*Centro de Investigación Biomédica en Red en Bioingeniería, Biomateriales y Nanomedicina, Madrid, Spain,* [3]*Biomedical Signal Interpretation and Computational Simulation, University of Zaragoza, Zaragoza, Spain,* [4]*University of Missouri School of Medicine, Department of Child Health and The Child Health Research Institute, Columbia, United States*

Introduction: Heart Rate Variability (HRV) activity in children changes across sleep stages and in the presence of apnoeic events. While previous studies compared HRV during sleep stages between OSA and healthy children, a segment-level characterization, regardless children diagnosis, has not been performed. In this context, a paediatric OSA-specific spectral band (BW2, 0.028–0.074 Hz), within very low frequency (VLF, 0–0.04 Hz) and low frequency (LF, 0.04–0.15 Hz), has been recently identified. However, BW2 evolution across sleep stages has not been evaluated. Our aim is to characterize and compare HRV segments in VLF, LF and BW2 bands based on sleep stages (NREM; REM and Wake) and the changes related to increased respiratory events presence.

Methods: A total of 1018 children (5–9.9 years) from the Childhood Adenotonsillectomy Trial were included. Overnight electrocardiogram recordings were segmented into 10-min epochs and categorized as Wake, NREM, or REM. Segments were also marked as control (no apnoeic events), mild OSA (1 to 5 events), moderate OSA (5 to 10 events) or severe OSA (over 10 events). VLF, LF, and BW2 activity for each segment were measured, and intra and inter-group comparisons were performed.

Results: BW2 and LF bands showed statistically significant differences in NREM sleep between all groups when separated by apnoeic events number (p-value < 10^{-20}), with the highest difference found in BW2 between control and severe OSA segments (median values 0.12 vs 0.39, respectively). For REM sleep, BW2 also showed improved and statistically significant differences between groups when separated by apnoeic event counts than LF and VLF. However, these differences were less prominent than in NREM, even though there is clustering of respiratory events during REM sleep.

Regarding sleep stages, only BW2 band showed no differences between REM and Wake in control segments. All the other comparisons showed statistically significant differences.

Conclusions: REM sleep is associated with enhanced sympathetic activity which may be masking the effect of apnoeic events on HRV. Therefore, alterations due to apnoeic events are better captured through the novel BW2 band during NREM, while in the absence of apnoeic events, sleep stages are better differentiated through VLF and LF classic bands.

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