

Conclusion: Our previous METSO trial demonstrated tailored OSA education is critical to increase adherence to recommended OSA care. While delivery of health information is generally associated with enhanced adherence to medical care, results of the present RCT favored an important role of peer-based social support leading to behavioral change towards receipt of OSA care.

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PHENOTYPING OF PATIENTS WITH MODERATE TO SEVERE OSA ON POLYSOMNOGRAPHY AFTER NEGATIVE HOME SLEEP APNEA TESTING

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Introduction: Polysomnography (PSG) is the gold standard for the diagnosis of obstructive sleep apnea (OSA). Given cost, insurance restrictions and in some cases limited access to sleep center testing, the use of home based sleep apnea testing is becoming increasingly more common. A proportion of patients with technically adequate HSAT who are negative end up having significant disease on PSG. The characteristics of patients who are found to have moderate to severe sleep apnea on polysomnogram (PSG) after a negative home sleep apnea test (HSAT) are not known. We aim to phenotype these patients.

Methods: We conducted a retrospective chart review from March 2018 to February 2020. A total of 953 adult patients (18 years old and older) underwent HSAT, 248 tests resulted negative (apnea-hypopnea index <5/h). Out of the negative HSAT, 17 patients had moderate to severe obstructive sleep apnea on PSG. Those were included for analysis. Data on patient characteristics such as age, body mass index (BMI), gender, STOP-BANG, ESS and comorbidities was gathered. Respiratory disturbance index, recording time, flow time, oximetry time on HSAT was recorded. PSG recording time, baseline AHI, supine AHI and non-supine AHI were also noted. Technically inadequate HSAT were excluded from analysis.

Results: The percentage of patients with negative HSAT who were found to have moderate to severe sleep apnea on PSG and were included for analysis was 6.85% (n17). Mean age was 41 years. Mean BMI was 33 kg/m². Common comorbidities were hypertension (29%), asthma (17.6%), depression (17.6%), anxiety (11.7%) and reflux (5.9%). Average ESS was 11.7 and STOP-BANG was 3.8. The mean recording time was 477 minutes, flow time 391 minutes and oximetry time was 426 minutes on HSAT. Average PSG recording time was 433 minutes. Average AHI was 24 with supine being 33.2/h and non-supine 17.9/h.

Conclusion: A proportion of patients with negative HSAT have moderate to severe OSA on follow-up polysomnogram. These patients were young, with lower-class obesity, more positional OSA, and no associated complex comorbidities. Re-evaluation of current diagnostic algorithms and further research is needed to phenotype this at-risk group, as first-line PSG may be more cost-effective and efficient.

Support (if any):

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AUTOMATIC DETECTION OF SELF-SIMILARITY AND PREDICTION OF CPAP FAILURE

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Introduction: Sleep disordered breathing is a significant risk factor for cardiometabolic and neurodegenerative diseases. Tolerance and efficacy of continuous positive airway pressure (CPAP), the primary form of therapy for sleep apnea, is often poor. High loop gain (HLG) is a driving mechanism of central sleep apnea or periodic breathing. The current study aimed to develop a computational approach to detect HLG based on self-similarity in respiratory oscillations during sleep solely using breathing patterns, measured via Respiratory Inductance Plethysmography (RIP). To quantify the potential utility of the developed similarity metric, the presented algorithm was used to predict acute CPAP failure.

Methods: We developed an algorithm for detecting apneas as periods with reduced breathing effort, manifested in the RIP signal as low signal amplitude. Our algorithm calculates self-similarity in breathing patterns between consecutive periods of apnea or hypopnea. Working under the assumption that high loop gain induces self-similar respiratory oscillations and increases the risk of failure during CPAP, the full night similarity, computed during diagnostic non-CPAP polysomnography (PSG), was used to predict failure of CPAP, which we defined as titration central apnea index (CAI) > 10. Central apnea labels are obtained both from manual scoring by sleep technologists, and from an automated algorithm developed for this study. The Massachusetts General Hospital (MGH) sleep database was used, including 2466 PSG pairs of diagnostic and CPAP titration PSG recordings.

Results: Diagnostic CAI based on technologist labels predicted failure of CPAP with an AUC of 0.82 ± 0.03. Based on automatically generated labels, the combination of full night similarity and automatically generated CAI resulted in an AUC of 0.85 ± 0.02. A subanalysis was performed on a population with technologist labeled diagnostic CAI > 5. Full night similarity predicted failure with an AUC of 0.57 ± 0.07 for manual and 0.65 ± 0.06 for automated labels.

Conclusion: This study showed that central apnea labels can be derived in an automated way. The proposed self-similarity feature, as a surrogate estimate of expressed respiratory high loop gain and computed from easily accessible effort signals, can detect periodic breathing regardless of admixed obstructive features such as flow-limitation, and can aid prediction of CPAP failure or success.

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SLEEP-DISORDERED BREATHING IS MORE PREDICTIVE THAN OBESITY OF INCREASED LEFT VENTRICULAR MASS INDEX IN BARIATRIC SURGERY PATIENTS

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Introduction: Obesity and obstructive sleep apnea (OSA) are associated with left ventricular hypertrophy and increased cardiovascular risk. Alternatively, the “obesity paradox” describes an improved prognosis from heart failure in obesity, though potentially attributable to confounding/bias. We sought to determine the contributions of obesity and sleep-disordered breathing (SDB) to left ventricular function and morphology in bariatric surgery candidates.

Methods: Patients undergoing polysomnography prior to bariatric surgery from 2011–2018 had demographic (age, gender, race),