(13.8% vs.11.3%, p=0.16). The composite outcome remained significantly associated with OAHS in the multivariable model: OR=1.36, 95%CI:1.005,1.845. Mortality was 2% in OASH and not significantly higher than non-OAHS (HR=1.39, 95%CI:0.56,3.42).
Conclusion: In this largest sample to date of systematically phenotyped OASH in patients undergoing bariatric surgery, we identify increased post-operative morbidity in those with OASH. Further study is needed to identify whether peri-operative treatment of OASH improves surgical outcomes.
Support:

0584

DETECTING SLEEP DISORDERED BREATHING USING SUB-TERAHERTZ RADIO-FREQUENCY MICRO-RADAR

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Introduction: New sensor technologies are entering sleep testing at a rapid pace; Neteera™ developed a novel sensor and algorithm for sleep apnea detection utilizing a contact-free, radar-based sensor system. The system utilizes a high-frequency, low-power, directional micro-radar which operates at ~120GHz and a sampling rate of 2500Hz as well as algorithms which are able to detect both pulse and respiratory activity of subjects during sleep.
Methods: Adult subjects undergoing diagnostic PSG for clinical purposes were simultaneously assessed with the novel micro-radar system with sensors under the mattress. Disordered breathing events (DBEs) were scored from the PSG using AASM scoring guidelines and were compared with those detected by the micro-radar sensor. Test data were grouped into three sets: 1. Single under mattress sensor; 2. Two under mattress sensors on each side of the bed (to improve signal capture); 3. After software optimization. The micro-radar sensor detected DBEs but software to describe the type of DBEs (obstructive apnea/central apnea/hypopnea) is still under development. Detection rate of DBEs was compared between the two methodologies and the development sets.
Results: n=22 (12 F, 10 M), Age=50.8±12.4 years, BMI=35.32±7.37 kg/m^2. Diagnostic PSG AHI: 19.7±29.4/hr, T_{90}=15.8±25.7%. Percent DBEs missed by the micro-radar sensor: 1st set=14.6±10.6%; 2nd set=9.4±8.3%; 3rd set=1.2±2.6%. Number of DBEs assessed for each set was 646, 1144, 125 events, respectively. With each successive set, the detection rate improved.
Conclusion: A novel micro-radar, non-contact sensor technology can be used to detect DBEs during sleep. Detection rate improved with utilization of two sensors per bed and software optimization. Future software development is expected to improve detection rate and facilitate breathing event classification into obstructive apneas/central apneas/hypopneas.
Support: None.

0585

C-REACTIVE PROTEIN IMPROVES THE ABILITY TO DETECT CARDIOMETABOLIC RISK IN MILD-TO-MODERATE SLEEP APNEA

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Introduction: Mild-to-moderate obstructive sleep apnea (OSA) affects 15-40% of the adult general population. However, it remains unclear when and how best to treat mild-to-moderate OSA. It has been shown that mild-to-moderate OSA in general random samples is associated with incident hypertension. The aim of this study was to compare the relative utility of apnea/hypopnea index (AHI) versus a biomarker of inflammation, C-reactive protein (CRP), in identifying the presence and severity of hypertension and insulin resistance (IR).
Methods: A clinical sample of 148 adults (53.79±12.45) with mild-to-moderate OSA (AHI between 5 and 29 events per hour) underwent 8-hour polysomnography, a clinical history and physical examination, including measures of blood pressure, body mass index (BMI), fasting blood glucose, insulin and CRP plasma levels. Hypertension was defined by previous diagnosis, past or present treatment, or blood pressure ≥140/90. IR was defined by homeostatic model assessment. Individuals with diabetes and/or on diabetes medication were excluded from analyses with IR. All analyses were conducted controlling for age, gender and BMI.
Results: CRP levels (OR=2.62, 95% CI=1.35-5.04, p=0.004), age (OR=1.75, 95% CI=1.11-2.75, p=0.016), and BMI (OR=2.74, 95% CI=1.20-6.26, p=0.017) were independently associated with greater odds for hypertension, whereas AHI (OR=1.33, 95% CI=0.61-2.92, p=0.477) was not. Additionally, CRP levels (β=0.21; p=0.04) and BMI (β=0.24; p=0.02) were independently associated with higher IR, while AHI (β=-0.03; p=0.75) was not. There was a trend for this association to be stronger in non-obese patients.
Conclusion: These preliminary findings suggest that including a measure of inflammation improves the ability for clinicians to detect cases of mild-to-moderate OSA with true cardiometabolic risk. CRP may be a simple, easy-to-use biomarker that can improve prognosis assessment and clarify which treatment option is best for patients with mild-to-moderate OSA.
Support: Department of Psychiatry, Penn State College of Medicine

0586

ADVANCED TREE MODELS TO PREDICT MODERATE-TO-SEVERE OBSTRUCTIVE SLEEP APNEA

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Introduction: The aim of this study was to develop a predicting model for the moderate-to-severe obstructive sleep apnea (OSA) by using advanced tree models.
Methods: We retrospectively investigated the medical records of patients who undertaken overnight polysomnography (PSG) at our sleep disorders center. We divided the data to a training set (70%) and a test set (30%), randomly. We made a random forest and a XGBoost model to predict the moderate-to-severe OSA (apnea hyponea index [AHI] ≥ 15/h) by using the training set, and then applied each models to the test set. To compare the fitness of the models, we used an accuracy, and an area under curve (AUC).
Results: Finally, 1,426 patients (AHI < 5:AHI ≥ 15= 464:962) were enrolled. The random forest model showed an accuracy of 0.79, and AUC of 0.82. In the random forest model, the sleep apnea scale of the sleep disorders questionnaire (SA-SDQ), age, neck circumference, male sex, body mass index (BMI), hypertension, and hyperlipidemia appeared in order of a variance importance. The XGBoost model showed an accuracy of 0.75 and AUC of 0.79.