activity of non-REM sleep that expresses a condition of sleep instability. The objective of the study was to compare CAP components between UARS patients and health individuals.
Methods: Fifteen subjects with UARS and 15 age- and sex- matched controls had their sleep study blinded analyzed. UARS criteria were the presence of sleepiness (Epworth Sleepiness Scale – ESS - ≥ 10) and/or fatigue (Modified Fatigue Impact Scale ≥ 38) associated with an apnea/hypopnea index (AHI) ≤ 5 and a respiratory disturbance index (RDI) > 5 events/hour of sleep, and/or flow limitation in more than 30% of total sleep time. Control group criteria were AHI < 5 events/hour, RDI ≤ 5 events/hour and < 30% of TST with flow limitation and ESS < 10, without sleep, clinical, neurological, or psychiatric disorder. CAP electroencephalogram of both groups was analyzed.
Results: We found higher CAP rate ($p = 0.05$) and CAP index in N1 stage ($p < 0.001$) and in N3 stage ($p < 0.001$) in UARS patients compared to control group. Considering only CAP phase A1 analysis, UARS patients presented higher CAP rate ($p = 0.05$) and CAP index in N1 stage ($p < 0.001$) as well as CAP index in N3 stage ($p < 0.001$) compared to control group. Considering only CAP phase A2 analysis, UARS patients also presented higher number of CAP in N1 stage ($p = 0.05$). There was no significant difference for CAP phase A3 between groups.
Conclusion: Although UARS is associated with high arousal index, we found increase in CAP phase A1 and A2, which do not include necessarily AASM arousals, suggesting not only sleep fragmentation but also sleep instability.
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EFFECT OF OBSTRUCTIVE SLEEP APNEA SEVERITY, SLEEP STAGE AND POSITION ON PATTERNS OF OXIMETRIC DESATURATIONS AND RESATURATIONS

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Introduction: Obstructive sleep apnea (OSA) severity based upon the apnea-hypopnea index (AHI) ignores many characteristics such as the duration of apnea-hypopneas, the duration and degree of oxygen desaturations (SpO2) etc. While hypoxemic burden has received increased attention given its relationship with cardiovascular outcomes, the role of oximetric resaturation vs. desaturation times is not understood. Resaturation times tend to be constant in contrast to desaturation durations. This study was done to assess desaturation and resaturation indices in patients with different OSA severity in differing sleep stages and positions.
Methods: Oximetric desaturation and resaturation slopes were calculated in patients with different OSA severities as rate of change in oxygen saturations (ΔSpO2/Δtime).
Results: 33 patients with OSA were studied (11 in each OSA severity group). Mean desaturation duration was 20.12 ±1.10 seconds with shorter NREM desaturation times (mean 19.07 ±1.11 seconds) as compared to REM desaturation durations (mean 26.66 ±2.69 seconds) (p-value 0.009). Non-supine and supine mean desaturation durations were similar (19.59 ±1.77 and 18.73 ±1.18 seconds respectively). Mean resaturation durations were shorter than desaturation durations at 12.46 ±0.84 seconds and was significantly lower in NREM sleep than in REM sleep (9.32 ±0.41 seconds vs 12.50 ±0.75 seconds p-value 0.002). Resaturation slopes (0.44 %/second (±0.028 %/second)) were steeper as compared to desaturation slopes (-0.26 %/second (±0.02 %/second)) without significant difference between NREM vs. REM desaturation or resaturation slopes. While desaturation slopes were not affected by sleep position, resaturation slopes were significantly steeper in supine compared to non-supine sleep (p-value 0.0046). Desaturation durations increased with OSA severity, but resaturation times decreased (resaturation slopes became steeper) with significant differences between patients with different OSA severity.
Conclusion: This study demonstrated that oxygen resaturation slopes varied according to different OSA severity and sleep position. Given that faster resaturation rates may reflect the possibility of higher degrees of reoxygenation-related oxidative stress, this should be assessed as a novel index to predicate OSA outcomes.
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COMPARISON OF OXYGENATION ABNORMALITIES BETWEEN OBSTRUCTIVE SLEEP APNEA AND CENTRAL SLEEP APNEA

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Introduction: The apnea-hypopnea index (AHI) is used as a generic index to quantify both central sleep apnea (CSA) and obstructive sleep apnea (OSA) syndromes. Patterns of oxygenation abnormalities seen in CSA and OSA may be key to understanding differing clinical impacts of these disorders. Oxygen desaturation and resaturation slopes and durations in OSA and CSA were compared between OSA and CSA patients.
Methods: Polysomnographic data of patients aged 18 years or older with diagnosis of OSA and CSA, at University of Iowa Hospitals and Clinics, were analyzed and demographic data were collected. Oximetric changes during hypopneas and apneas were studied for desaturation/resaturation durations and desaturation/resaturation slopes. Desaturation and resaturation slopes were calculated as rate of change in oxygen saturation (ΔSpO2/Δtime). Comparison of hypoxemia-based parameters between patients with OSA and CSA was performed using unpaired t-test.
Results: 32 patients with OSA with median AHI of 15.4 (IQR 5.1 to 30.55) and median ODI of 15.47 (IQR 9.50 to 29.33) were compared to 15 patients with CSA with a median AHI of 20.4 (IQR 12.6 to 47.8) and median ODI of 27.56 (IQR 17.99 to 29.57). The mean number of desaturation and resaturation events was not significantly different between patients with OSA and CSA (OSA - 106.81±87.93; CSA - 130.67±76.88 with a p-value 0.1472). 4/15 CSA patients had Cheyne-Stokes breathing, 2/15 had treatment emergent central sleep apnea, 1/15 had methadone-associated CSA and for 8/15, no etiologies for CSA were found. Mean desaturation durations was significantly longer in OSA (20.84 s ± 5.67) compared to CSA (15.94 s ± 4.54) (p=0.0053) and consequently the desaturation slopes were steeper in CSA than OSA (-0.35%/sec ±0.180 vs. -0.243 ± 0.073; p=0.0064). The resaturation duration was not significantly longer in OSA (9.76 s ± 2.02) than CSA (9.057 s ± 2.17) (p=0.2857). Differences between desaturation duration and slopes between CSA and OSA persisted during REM and NREM sleep, and in supine sleep.
Conclusion: As compared to OSA, patients with CSA have different patterns of desaturations and resaturations with lesser hypoxic burden with CSA. This may have implications on the clinical outcomes seen between these two disorders.
Support (if any):