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Title: Overnight transcutaneous carbon dioxide monitoring in eucapneic patients with obstructive sleep apnea syndrome

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Body: It is well-known that 11-43% of obstructive sleep apnea syndrome (OSAS) patients experience daytime hypercapnia and they also have elevated pCO2 during sleep. We aimed to monitor pCO2 during sleep by transcutaneous pCO2(PtcCO2) measurements and find out its relationship with polysomnographic data. Between October-2011 and December-2012, 139 patients underwent PtcCO2 monitoring. All cases were evaluated with arterial blood gases and pulmonary function tests. Thirteen cases with COPD and/or daytime hypercapnia and 29 cases whose PtcCO2 records could not be evaluated were excluded. Chi-square, Fisher's exact test, Mann Whitney U Test, Student's T test and Pearson correlation tests were used in statistical analysis. Mean age of 59(60.8%) male and 38(39.2%) female cases was 46.8±10.3. Mean overnight PCO2 was ≤45 mmHg in 84(86.6%) and >45 mmHg in 13(13.4%) cases. Number of cases with AHI >15 was higher in PCO2>45 group when compared to PCO2 ≤45 group without statistical significance (76.9% vs. 59.5% respectively, p=0.078). Mean apnea period, apnea/interapnea periods were similar. Mean PtcCO2 values were found to be correlated with time spent during SpO2<88% (r=0.220, p<0.031). Of the patients, 60(61.8%) had AHI>15 (moderate to severe OSAS) and 37(37.2%) had AHI<15 (mild OSAS). Of the former group, 16.7% had mean PtcCO2 >45 mmHg, while this ratio was 8.1% in the latter group but the difference was not statistically significant (p=0.359). In AHI>15 group, highest PCO2 were significantly higher (p<0.05). We conclude that OSAS patients with no obesity-hypoventilation syndrome nor COPD may experience hypercapnia in a correlation with nocturnal desaturation time.