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REM-sleep dependent OSA in patients with Chronic Obstructive Pulmonary Disease (REM-Overlap syndrome) – clinical impact

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Background: Coexisting obstructive sleep apnoea (OSA) in patients with chronic obstructive pulmonary disease (COPD), defined as overlap syndrome (OVS), is prevalent and underdiagnosed. REM-sleep dominant OSA is known to be associated with adverse health outcomes in non-COPD patients. However, the prevalence and consequences of REM-OSA in COPD patients is unknown.

Methods: 105 COPD patients (mean age 68.1±9 years, BMI 28.3±6.0 kg/m2, 44% males, GOLD stages I to IV in 2%, 40%, 42%, and 16%, respectively) underwent assessment at an outpatient COPD-clinic including anthropometrics, arterial blood gas (ABG) and spirometry in this clinical cohort study, PAT-based sleep studies were performed. OSA was defined as Apnea Hypopnea Index (AHI) ≥15/h. Predictors of OVS and ABG were determined. Clinical features of Rapid Eye Movement (REM) sleep-related OSA in COPD (REM-OVS) were analyzed.

Results: 49 COPD patients (46%) suffered from moderate to severe OSA (OVS group, mean AHI 30.8±18 n/h, REM-Oxygen Desaturation Index (REM-ODI) 26.9±17 n/h). OVS was more prevalent in males compared to females (59% and 37%, P=0.029, respectively). Age (70.1±8 versus 66.3±10 years), BMI (30.0±6 versus 26.4±7 kg/m2), hypertension prevalence (71% versus 45%) and the number of nocturnal awakenings were all elevated (p<0.03, respectively), while deep sleep (12.7±7% and 15.4±6%, p=0.029), and mean overnight oxygenation (90.6±3% and 92.3±2%, p=0.003) were lower in OVS compared to COPD alone. REM-ODI was independently associated with daytime pCO2 (β=0.022, p<0.001). REM-dominant OVS was observed in 12 patients (11.4%) and was associated with an elevated prevalence of cardiovascular disease including atrial fibrillation (25% and 3%, P=0.022) and arterial hypertension (92% versus 64%, p=0.07).

Conclusions: OVS was highly prevalent, specifically in obese males. REM-dominant OSA showed strong association with elevated daytime pCO2 and REM-OVS is characterized by highly prevalent cardiovascular disease. Disordered breathing during REM sleep may have a particularly adverse impact on cardiorespiratory health in COPD patients (Hanson et al, ERJ Open 2023).