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Title: Clinical phenotypes in patients with concomitant obstructive sleep apnea and chronic obstructive pulmonary disease

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Body: Rationale: Concomitant obstructive sleep apnea syndrome (OSAS) and COPD (overlap syndrome, OLS) may result in the presentation of different clinical phenotypes of each disease. Objectives: To examine the clinical phenotypes of COPD in OLS cases. Methods: We conducted a prospective cohort study including 204 patients recruited in 8 years. All the subjects underwent the examinations: pulmonary function tests; polysomnography (PSG); blood chemistry tests, including a KL-6 test; nutritional assessments; computed tomography (HRCT) to assess emphysema (LAA%); and 6-minute walk tests (6MWT). Subjects with symptomatic airflow obstruction were classified as COPD patients, and the apnea-hypopnea index (AHI) was calculated for assessing OSAS. We analyzed the association between the variables recorded during the examinations. Results: The overall cohort included 138 male subjects and 23 female subjects (mean age, 54.8 years). The mean FEV1:FVC ratio, mean body mass index (BMI), and mean AHI were 0.77, 25.3, and 30.3, respectively. The AHI values were as follows: 0–5 (n = 9), 5–15 (n = 36), 15–30 (n = 50), and >30 (n = 66). The subjects were divided into the OLS group (n = 34), OSAS alone group (n = 118), COPD alone group (n = 0), and neither group (n = 9). The mean age, BMI, and AHI in the OLS were 66.4, 24.5, and 34.7, respectively. AHI was significantly associated with BMI in the OSAS alone group. This association was not seen in the OLS group, in which there was a trend that low FEV1% predicted was associated with low AHI and AHI was significantly associated with KL-6 (p < 0.0002). Conclusions: We concluded that OLS did not affect the clinical phenotypes of OSAS and COPD.