Prevalence of Chronic Obstructive Pulmonary Disease with Preserved Ratio Impaired Spirometry (COPD-PRISM) and Clinical Outcomes in Ramathibodi Hospital

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Background: Chronic obstructive pulmonary disease (COPD) is diagnosed using symptoms, risk factors exposure, and persistent airflow limitation. In addition, FEV1/FVC ratio less than 0.7 defines persistent airflow limitation. However, COPD with preserved ratio with impaired spirometry (PRISM) is noted in practice and associated with symptoms and exacerbation. PRISM in Thai COPD has never been studied.

Objective: To identify the prevalence of PRISM-COPD and clinical outcome in Thai COPD cohort treated and factors associated including radiology findings.

Methods. The retrospective study was done in clinical diagnosed COPD patients treated at Ramathibodi Hospital from 2015 to 2017. Spirometry was performed. Exacerbations of COPD were reviewed. COPD assessment test (CAT) and modified MRC were measured. Clinical features, chest radiographs, and outcomes were compared with COPD having lower FEV1/FVC ratio.

Results: Total 106 clinician diagnosed COPD patients were recruited. Patients were classified to 3 groups; PRISM in 23.6%, COPD with preserved ratio and preserved FEV1 (FEV1 more than 80% predicted) in 18.9% and COPD with FEV1/FVC ratio less than 0.7 in 57.5% of cohort. Age, BMI and smoking pack-year were not different between the 3 groups. The 6-minute walk distance was significantly lower in COPD with lower FEV1/FVC ratio (381.9 ± 109.4 m) and PRISM-COPD (412.9 ±101.5 m) when compared to normal ratio and normal FEV1 (488.4 ± 91.57 m) (p=0.001). The median CAT score was higher in COPD with low FEV1/FVC ratio (11 range 2 to 32) and PRISM-COPD (10 range 0 to 20) compared to COPD with preserved ratio and preserved FEV1 (5 range from 2 to 20) (p=0.004). Nevertheless, modified MRC was not different among the 3 groups. There was no difference between 3 groups of COPD in terms of COPD exacerbation in the past year. The common radiographic findings in COPD patients with impaired FEV1/FVC ratio were lung lucrence (81.5%), reduced vascular marking (79.1%), pulmonary fibrosis (60.9%), increased lung volume (39.5%), and bronchiectasis (27.9%).

Conclusion: One-fourth of Thai COPD patients are compatible with PRISM-COPD. Despite having normal FEV1/FVC ratio, increased symptoms and reduced exercise tolerance are noted in this COPD subset. The contributing factors are associated lung fibrosis and air trapping causing normalized FEV1/FVC ratio.

Keywords: COPD, Low ratio, Clinical outcomes, Radiology