Effects of Blood Eosinophil Level and Exacerbations in Patients with COPD in Phramongkutklao Hospital

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Background: Chronic obstructive pulmonary disease (COPD) is currently the fourth leading cause of death worldwide and exacerbations are associated with poor quality of life, and increase of morbidity and mortality. High level of blood eosinophil is a potential surrogate biomarker of eosinophilic airway inflammation in COPD patients, and associated with an increased risk of exacerbations. However, data are limited on level of blood eosinophil that is associated with exacerbations and limited in Thai population.

Objective: To evaluate the correlation of blood eosinophil level and exacerbation of COPD in Thai patients.

Methods: We performed a cross sectional case-control study in patients with COPD based on spirometry in two groups by exacerbation history at outpatient clinic at Phramongkutklao Hospital during November 2016 - November 2017. Exacerbation was defined as a COPD hospitalization or Emergency department visit due to COPD at least 2 times in 1 year. We recorded baseline characteristics, blood eosinophils, medications, smoking history, and COPD Assessment test (CAT) questionnaire.

Results: A total of 64 patients were included in this study. They were divided into two groups by exacerbation history. Thirty patients had exacerbation history and 34 patients didn’t have exacerbation history. Mean age of patients was 75.7±8.23 and 73.41±7.99 years in the exacerbation and the non-exacerbation groups. The most common underlying disease was hypertension 43.5% and 56.5% in the exacerbation and the non-exacerbation groups, respectively. Mean percentage of blood eosinophil level and absolute blood eosinophil level in the exacerbation group was higher than the non-exacerbation group (5.85±4.45%, 462.79x106±368.38x106 cells/L and 4.19±4.58%, 347.35x106 ±411.67x106 cells/L), respectively. AUROC for percentage of blood eosinophil level was 0.65, P=0.0326 and the best cut-off point was 2.7% (sensitivity=80%, specificity=47.06%), with an odds ratio of 3.158, P=0.045 (95% CI 1.028-9.697). AUROC for absolute blood eosinophil level was 0.632, with the cut-off point of 252x106 cells/L, while the sensitivity and specificity was 70% and 61.67%, respectively with an odds ratio of 3.333, P=0.023 (95% CI 1.181-9.406).

Conclusion: The percentage of blood eosinophil and absolute eosinophil level of >2.7% and >252x106 cells/L are associated with increased risk of exacerbations in Thai patients with COPD.

Keywords: COPD, Exacerbations, Percent blood eosinophil level, Absolute blood eosinophil level