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# COPD exacerbations and patient-reported outcomes according to post-bronchodilator FEV<sub>1</sub> – a post-hoc analysis of pooled data

Chee-Shee Chai<sup>1\*</sup>, Diana-Leh-Ching Ng<sup>1</sup>, Sumastika Bt Mos<sup>2</sup>, Muhammad Amin B Ibrahim<sup>3</sup>, Seng-Beng Tan<sup>4</sup>, Yong-Kek Pang<sup>4</sup> and Chong-Kin Liam<sup>4</sup>

## Abstract

**Background** Management strategies of chronic obstructive pulmonary disease (COPD) need to be tailored to the forced expiratory volume in one second (FEV<sub>1</sub>), exacerbations, and patient-reported outcomes (PROs) of individual patients. In this study, we analyzed the association and correlation between the FEV<sub>1</sub>, exacerbations, and PROs of patients with stable COPD.

**Methods** This was a post-hoc analysis of pooled data from two cross-sectional studies that were previously conducted in Malaysia from 2017 to 2019, the results of which had been published separately. The parameters measured included post-bronchodilator FEV<sub>1</sub> (PB-FEV<sub>1</sub>), exacerbations, and scores of modified Medical Research Council (mMRC), COPD Assessment Test (CAT), and St George's Respiratory Questionnaire for COPD (SGRQ-c). Descriptive, association, and correlation statistics were used.

**Results** Three hundred seventy-four patients were included in the analysis. The PB-FEV<sub>1</sub> predicted was < 30% in 85 (22.7%), 30–49% in 142 (38.0%), 50–79% in 111 (29.7%), and ≥ 80% in 36 (9.6%) patients. Patients with PB-FEV<sub>1</sub> < 30% predicted had significantly more COPD exacerbations than those with PB-FEV<sub>1</sub> 30–49% predicted ( $p < 0.001$ ), 50–79% predicted ( $p < 0.001$ ), and ≥ 80% predicted ( $p = 0.002$ ). The scores of mMRC, CAT, and SGRQ-c were not significantly higher in patients with more severe airflow limitation based on PB-FEV<sub>1</sub> ( $p = 0.121$ – $0.271$ ). The PB-FEV<sub>1</sub> predicted had significant weak negative correlations with exacerbations ( $r = -0.182$ ,  $p < 0.001$ ), mMRC ( $r = -0.121$ ,  $p = 0.020$ ), and SGRQ-c scores ( $r = -0.114$ ,  $p = 0.028$ ). There was a moderate positive correlation between COPD exacerbations and scores of mMRC, CAT, and SGRQ-c ( $r = 0.407$ – $0.482$ , all  $p < 0.001$ ). There were significant strong positive correlations between mMRC score with CAT ( $r = 0.727$ ) and SGRQ-c scores ( $r = 0.847$ ), and CAT score with SGRQ-c score ( $r = 0.851$ ) (all  $p < 0.001$ ).

**Conclusions** In COPD patients, different severity of airflow limitation was not associated with significant differences in the mMRC, CAT, and SGRQ-c scores. Exacerbations were significantly more frequent in patients with very severe airflow limitation only. The correlation between airflow limitation with exacerbations, mMRC, and SGRQ-c was weak.

\*Correspondence:  
Chee-Shee Chai  
cschai@unimas.my

Full list of author information is available at the end of the article



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