

## Factors associated with the rate of COPD exacerbations that require hospitalization

Radisa PAVLOVIC<sup>1\*</sup>, Srdjan STEFANOVIĆ<sup>1</sup>, Zorica LAZIC<sup>1,2</sup>, Slobodan JANKOVIĆ<sup>1,3</sup>

<sup>1</sup>Faculty of Medical Science, University of Kragujevac, Kragujevac, Serbia

<sup>2</sup>Clinic of Pulmonary Diseases, University Clinical Center Kragujevac, Kragujevac, Serbia

<sup>3</sup>Department of Clinical Pharmacology, University Clinical Center Kragujevac, Kragujevac, Serbia

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**Background/aim:** Exacerbations are key events in chronic obstructive pulmonary disease (COPD). Frequent exacerbations occurring during the natural course of COPD lead to deterioration of health-related quality of life and are major causes of morbidity and mortality. The aim of this study was to identify factors independently associated with frequent severe exacerbations of COPD that require hospitalization.

**Materials and methods:** A case-control study was performed to analyze risk factors and frequency of severe exacerbations, which were defined by the GOLD guideline criteria. Stepwise multivariate regression was used to determine the significant predictors of frequent exacerbations.

**Results:** Results revealed five independent predictors of frequent exacerbations: age, length of hospital stay, FEV1/FVC ratio, CRP level above 10 mg/L, and respiratory comorbidities.

**Conclusion:** COPD patients should be more carefully assessed in terms of age, length of hospital stay, FEV1/FVC ratio, CRP level, and respiratory comorbidities. Patients under 65 years of age with respiratory comorbidities, longer hospital stay, lower FEV1/FVC ratio and CRP of <10 mg/L are more prone to experiencing a minimum of one additional hospitalization in the following year. Patients could spend less time in the hospital environment and increase their quality of life by adjusting these risk factors for hospitalization due to COPD.

**Key words:** Chronic obstructive pulmonary disease, severe exacerbation, exacerbation frequency, risk factors, hospitalization

### 1. Introduction

Chronic obstructive pulmonary disease (COPD) is a both treatable and preventable clinically heterogeneous syndrome, with prevalence somewhat lower than 6% (1). Frequent exacerbations occurring during the natural course of COPD lead to deterioration of health-related quality of life and are major causes of morbidity and mortality (2). They have high prevalence and high impact on disease progression and prognosis; they accelerate the decline in lung function, have a negative impact on quality of life, promote frequent clinic visits and hospitalizations, and are responsible for a large proportion of the health care costs (3–5).

Recently, a distinct subgroup of patients named “frequent exacerbators” was introduced (2,3). These are the patients with comparable lung function impairment to that of other patients, but with more frequent exacerbations. Although this frequent exacerbator phenotype occurs regardless of GOLD stage, the exacerbation rate increases with severity of the disease (3–8).

To date, the history of exacerbations has been recognized as the single best predictor of future events (3,9). Obvious correlation has been revealed between decreased lung function and disease severity (10), elevated white-cell count (3,11), hematocrit level of <41% (12), BODE score, sex, age, smoking status, body mass index, presence of cardiovascular comorbidity (13,14), influenza and 23-valent pneumococcal immunizations (5), and frequency of severe exacerbations of COPD. However, other studies failed to confirm the influence of other risk factors such as blood glucose level, FEV1% predicted, long-acting bronchodilator use, or inhaled or systemic steroid use (2,15).

Prevention of exacerbations is a key component of strategies for COPD treatment and that is why it is important to understand the risk factors, incidence, characteristics, and effects of exacerbations in patients with COPD. Nevertheless, it is important to identify patients at risk for frequent exacerbations at various levels of disease

\* Correspondence: rpavlovic@medf.kg.ac.rs













