

ABSTRACT

THE ASSOCIATION BETWEEN EXACERBATED COPD PATIENTS AND SERUM INTERLEUKIN-8 (IL-8) AND NEUTROPHIL-TO-LYMPHOCYTE RATIO (NLR) AT PROVINCIAL HOSPITALS IN LAMPUNG

By

I MADE AFRYAN S.L

Background: Chronic Obstructive Pulmonary Disease (COPD) is a leading cause of global morbidity and mortality, with many cases experiencing exacerbations that may become life-threatening without optimal management. In 2024, among 90 COPD inpatients at General Hospital Dr. H. Abdul Moeloek, the prevalence of COPD exacerbation reached 57.6%. COPD exacerbations are characterized by an acute worsening of respiratory symptoms such as cough, dyspnea, and increased sputum production, often triggered by respiratory infections, pollution, or other irritants. These events induce airway inflammation that narrows the airways and may become life-threatening. The inflammatory response in COPD exacerbations is predominantly neutrophilic, driven by elevated Interleukin-8 (IL-8) as a key chemokine recruiting neutrophils into the airways. This massive recruitment worsens lung damage and is systemically reflected by an increased Neutrophil-to-Lymphocyte Ratio (NLR). Thus, IL-8 represents local inflammation, while NLR serves as a systemic biomarker of inflammation and exacerbation severity. **Objective:** To investigate the relationship between COPD exacerbation and serum Interleukin-8 (IL-8) levels as well as the Neutrophil-to-Lymphocyte Ratio (NLR) in patients at RS Provinsi Lampung. **Methods:** An observational analytic study with a cross-sectional design was conducted by measuring serum IL-8 and NLR levels. Data were analyzed using the independent t-test. **Results:** A total of 60 subjects were enrolled, consisting of 20 patients with stable COPD and 40 patients with COPD exacerbation. The results showed that both IL-8 and NLR were statistically significant inflammatory predictors of COPD exacerbation, with IL-8 (Sig. = 41.5, $p < 0.001$) and NLR (Sig. = 0.001, $p < 0.001$). **Conclusion:** Serum IL-8 and NLR levels were significantly elevated in patients with COPD exacerbation, supporting their role as potential biomarkers of disease activity and exacerbation severity.

Keywords: COPD Exacerbation, Interleukin-8, Neutrophil-to-Lymphocyte Ratio

ABSTRAK

HUBUNGAN ANTARA PASIEN YANG TERDIAGNOSIS PPOK EKSASERBASI TERHADAP SERUM INTERLEUKIN-8 (IL-8) DAN *NEUTROPHIL TO LYMPHOCYTE RATIO* (NLR) DI RUMAH SAKIT PROVINSI LAMPUNG

By

I MADE AFRYAN S.L

Latar Belakang: Penyakit Paru Obstruktif Kronik (PPOK) merupakan penyebab utama morbiditas dan mortalitas global dengan banyak kasus mengalami eksaserbasi yang dapat mengancam jiwa bila tidak mendapatkan penatalaksanaan yang optimal. Tahun 2024 terdapat 90 pasien PPOK rawat inap di RSUD Dr. H. Abdul Moeloek prevalensi eksaserbasi PPOK mencapai 57,6%. Selain itu di RS Provinsi Lampung pada tahun 2025 terdapat 40 pasien mengalami eksaserbasi PPOK dan 20 pasien mengalami PPOK stabil. PPOK eksaserbasi ditandai dengan perburukan akut gejala pernapasan, seperti batuk, sesak, dan peningkatan produksi dahak, sering diakibatkan oleh infeksi saluran napas, polusi, atau iritan lain, sehingga menimbulkan inflamasi pada saluran napas yang mempersempit jalan udara dan dapat mengancam jiwa. Inflamasi pada PPOK eksaserbasi didominasi respon neutrofilik akibat peningkatan Interleukin 8 (IL-8) sebagai kemokin utama perekrut neutrofil. Rekrutmen ini memperburuk kerusakan paru dan tercermin sistemik melalui peningkatan NLR, sehingga IL-8 menggambarkan inflamasi lokal, sementara NLR menjadi biomarker inflamasi sistemik dan keparahan eksaserbasi. **Tujuan:** Mengetahui hubungan antara pasien yang terdiagnosis PPOK eksaserbasi terhadap serum Interleukin 8 (IL-8) dan *Neutrophil-to-Lymphocyte Ratio* di RS Provinsi Lampung. **Metode:** Analitik observasional dengan rancangan *Observational Cross Sectional*, yaitu melakukan pengukuran nilai serum IL-8 dan kadar *Neutrophil to Lymphocyte Ratio*. Analisis menggunakan uji *t-test independent* untuk data berpasangan. **Hasil:** Responden pada penelitian ini sebanyak 60 orang dengan keadaan PPOK stabil 20 orang dan PPOK eksaserbasi 40 orang. Hasil menunjukkan bahwa prediktor inflamasi IL-8 dan *Neutrophil to Lymphocyte Ratio* (NLR) signifikan secara statistik dalam memprediksi keadaan eksaserbasi PPOK. Dengan hasil statistik signifikansi IL-8 (Sig. = 41,5) $p\text{-value} < 0.001$ dan signifikansi NLR (sig. = 0.001) $p\text{-value} < 0.001$ **Kesimpulan:** Terdapat peningkatan kadar serum IL-8 dan kadar NLR pada pasien PPOK eksaserbasi

Kata kunci: PPOK Eksaserbasi, Interleukin-8, *Neutrophil-to-Lymphocyte Ratio*