

Tesis

**PERBEDAAN KADAR INTERLEUKIN 6, FERITIN, DAN
PARAMETER HEMATOLOGI PADA PASIEN
COVID-19 YANG DIRAWAT DI RUANG
ICU DAN NON-ICU**



**PROGRAM STUDI PATOLOGI KLINIS PROGRAM SPESIALIS I
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PERBEDAAN KADAR INTERLEUKIN 6, FERITIN, DAN PARAMETER HEMATOLOGI PADA PASIEN COVID-19 YANG DIRAWAT DI RUANG ICU DAN NON-ICU

ABSTRAK

Latar Belakang: Penanda inflamasi dan hematologi adalah parameter laboratorium penting untuk menilai stratifikasi pasien COVID-19. Feritin dan interleukin 6 merupakan *biomarker* yang signifikan untuk mendeteksi badai sitokin, peradangan sistemik, dan prognosis COVID-19. Parameter hematologi rutin diperiksa pada awal dan selama rawatan karena berhubungan dengan tingkat keparahan COVID-19. Penelitian ini bertujuan menentukan perbedaan kadar IL-6, ferritin, dan parameter hematologi (jumlah leukosit, neutrofil, limfosit, dan trombosit) pasien COVID-19 yang dirawat di ICU dan non-ICU RSUP. Dr. M. Djamil Padang.

Metode: Penelitian analitik dengan rancangan potong lintang komparatif terhadap 62 orang pasien COVID-19 yang dirawat di ICU dan non ICU. Penelitian dilakukan di Instalasi Laboratorium Sentral dan Rekam Medis RSUP Dr. M. Djamil Padang (Mei sampai November 2021). Pemeriksaan kadar IL-6 menggunakan metode ECLIA, feritin dengan metode ELFA, jumlah leukosit, neutrofil, limfosit, dan trombosit dengan metode *flowcytometry*. Analisis bivariat menggunakan uji *independent sample T test* dan *Mann-Whitney*, analisis multivariat menggunakan uji *regresi binary logistic*, bermakna jika $p < 0,05$.

Hasil: Karakteristik pasien COVID-19 rawatan ICU: laki-laki sebanyak 64,5%, rerata usia 53,52 (10,71) tahun, meninggal 48,4%, sedangkan rawatan non ICU: perempuan sebanyak 71,0%, rerata usia 42,32 (12,22) tahun, sembuh 100%. Penyakit penyerta terbanyak hipertensi. Uji statistik menunjukkan terdapat perbedaan bermakna kadar IL-6, feritin, jumlah leukosit, neutrofil, dan limfosit pada pasien COVID-19 rawatan ICU dan non ICU ($p < 0,001$). Tidak terdapat perbedaan jumlah trombosit pasien COVID-19 rawatan ICU dan non ICU ($p = 0,603$). Uji multivariat didapatkan feritin adalah parameter yang paling berperan terhadap tingkat keparahan pasien COVID-19 ($p < 0,05$) dengan OR 1,03 (IK 95% 1,00-1,01).

Simpulan: Terdapat perbedaan kadar IL-6, feritin, jumlah leukosit, jumlah neutrofil, jumlah limfosit pasien COVID-19 rawatan ICU dan non ICU. Feritin merupakan faktor yang paling berperan terhadap keparahan pasien COVID -19 rawatan ICU dan non ICU.

Kata Kunci : IL-6, feritin, leukosit, neutrofil, limfosit, trombosit, COVID-19

**COMPARISON IN LEVELS OF INTERLEUKIN 6, FERRITINE,
AND HEMATOLOGICAL PARAMETERS IN
COVID-19 PATIENS TREATED IN
ICU AND NON-ICU**

ABSTRACT

Background: Inflammatory and hematological markers are important laboratory parameters to assess the stratification of COVID-19 patients. Ferritin and interleukin 6 can serve as significant biomarkers in the detection of cytokine storm, systemic inflammation, and the prognosis of COVID-19. Examinations of hematological parameters at baseline and during treatment are related to the severity of COVID-19. The aim of this study to determine differences in levels of IL-6, ferritin, and hematological parameters such as the the number of leukocytes, neutrophils, lymphocytes, and platelets in COVID-19 patients treated in ICU and non-ICU in Dr. M. Djamil Padang hospital.

Methods: This study was with comparative cross-sectional design of 62 COVID-19 patients who were treated in the ICU and non-ICU. Research was conducted at the Central Laboratory and Medical Record of Dr. M. Djamil Padang hospital (May to September 2021). Interleukin-6 levels determined the ECLIA methods, ferritin with the ELFA method, leukocytes, neurophiles, lymphocytes, and platelets counts used the flowcytometry method. Bivariate data were analyzed with independent sample T test and Mann-Whitney test, multivariate data were analyzed with binary logistic regression, and considered significant if $p < 0.05$.

Results: The characteristics of COVID-19 patients treated in ICU: 64.5% male, average age was 53.52 (10.71) years, 48.4% with, and non ICU: female 71.0%, average 42.32 (12.22) years old, and recovered 100%. The most common comorbidity is hypertension. Statistical tests showed that there were significant differences in levels of IL-6, ferritin, leukocytes, neutrophils, and lymphocytes counts in ICU and non-ICU patients with COVID-19 ($p < 0.001$). There was no difference in the platelet count of COVID-19 patients treated in ICU and non-ICU ($p = 0.603$). The multivariate test found that ferritin was the most important parameter in the severity of COVID-19 patients ($p < 0.05$) with an OR of 1.03 (95% CI 1.00-1.01). Multivariate test obtained ferritin levels was the most important parameter in the severity of COVID-19 patients ($p < 0.05$) with OR 1.03 (95% CI 1.00-1.01).

Conclusion: There are differences in levels of IL-6, ferritin, leukocyte, neutrophil, lymphocyte between ICU and non ICU patients. Ferritin is the most important factor in the severity of ICU and non ICU COVID-19 patients.

Keywords: IL-6, ferritin, leukocytes, neutrophils, lymphocytes, platelets, COVID-19