

INTISARI

Latar Belakang: Penyakit kardiovaskular merupakan masalah kesehatan global yang sering memerlukan tindakan bedah, termasuk operasi jantung dengan mesin *cardiopulmonary bypass* (CPB). Prosedur ini berisiko menimbulkan komplikasi, terutama inflamasi, yang dapat memperburuk luaran klinis seperti memperpanjang lama perawatan di ICU. Marker inflamasi konvensional seperti CRP, IL-6, dan TNF α memiliki keterbatasan dalam hal waktu dan biaya. Saat ini, *monocyte to lymphocyte ratio* (MLR) banyak dimanfaatkan sebagai marker inflamasi alternatif yang lebih sederhana dan ekonomis. Studi sebelumnya menunjukkan bahwa MLR $\geq 0,2$ berhubungan dengan peningkatan mortalitas pascaoperasi jantung. Saat ini, belum ada bukti yang secara spesifik mengevaluasi MLR $>0,2$ sebagai prediktor lama rawat di ICU pada pasien pasca CPB.

Tujuan: Penelitian ini bertujuan untuk mengetahui apakah *monocyte to lymphocyte ratio* intraoperasi $\geq 0,2$ dapat digunakan sebagai prediktor lama rawat di ICU pasca *cardiopulmonary bypass*.

Metode: Desain penelitian ini adalah observasional analitik dengan pendekatan *cohort prospective*. Subjek penelitian adalah pasien operasi bedah jantung dengan CPB di RSUP Dr. Sardjito Yogyakarta pada bulan Juli-November 2023. *Monocyte to lymphocyte ratio* diperiksa intraoperasi. Subjek diklasifikasikan menjadi dua kelompok berdasarkan MLR intraoperasi dengan *cut off* 0,2 dan diamati luaran klinis lama rawat di ICU. Prediksi pemanjangan lama perawatan di ICU dinyatakan dalam *Relative Risk* (RR) dengan analisis bivariat. Nilai $p < 0,05$ dianggap bermakna secara statistik.

Hasil: Penelitian melibatkan 50 subjek, dengan 29 (58%) subjek MLR $\geq 0,2$ dan 21 (42%) subjek MLR $< 0,2$. Subjek terdiri dari 28 laki – laki (56%) dan 22 perempuan (44%). Terdapat perbedaan bermakna antar 2 kelompok untuk lama rawat di ICU ($p=0,048$). Hasil analisis bivariat faktor prediktor lama rawat di ICU, menunjukkan hasil signifikan pada MLR intraoperasi RR: 1,514; 95% CI 0,967-2,370 $p=0,04$.

Kesimpulan: *Monocyte to Lymphocyte Ratio* intraoperasi $\geq 0,2$ dapat menjadi prediktor lama rawat di ICU ≥ 72 jam.

Kata Kunci: *monocyte to lymphocyte ratio*, *cardiopulmonary bypass*, lama rawat di ICU

ABSTRACT

Background: Cardiovascular disease is a global health problem that often requires surgery, including cardiac surgery with a cardiopulmonary bypass (CPB) machine. This procedure is at risk of complications, especially inflammation, which can worsen clinical outcomes such as prolonging the length of stay in the ICU. Conventional inflammatory markers such as CRP, IL-6, and TNF α have limitations in terms of time and cost. Currently, monocyte to lymphocyte ratio (MLR) is emerging as a simpler and economical alternative inflammatory marker. Previous studies have shown that MLR >0.2 is associated with increased mortality after cardiac surgery. However, there is no evidence that specifically evaluates MLR >0.2 as a predictor of ICU length of stay in post-CPB patients.

Objective: This study aims to determine whether intraoperative monocyte to lymphocyte ratio ≥ 0.2 can predict the length of stay in the ICU after cardiopulmonary bypass.

Methods: The design of this study was an observational analytic study with a retrospective cohort approach. The research subjects were cardiac surgery patients with CPB at RSUP Dr. Sardjito Yogyakarta in July-November 2023. Monocyte to lymphocyte ratio was checked intraoperative. Subjects were classified into two groups based on intraoperative MLR with a cut-off of 0.2 and clinical outcomes of ICU length of stay were observed. Predicted ICU length of stay was expressed as Relative Risk (RR) through bivariate analysis. P value <0.05 was considered statistically significant.

Results: The study included 50 subjects, with 29 (58%) subjects MLR ≥ 0.2 and 21 (42%) subjects MLR <0.2 . The subjects consisted of 28 males (56%) and 22 females (44%). There was a significant difference between the 2 groups for ICU length of stay ($p=0.048$). Positive correlation of MLR with length of ICU stay $r=0.372$; $p=0.008$). The results of bivariate analysis of predictors of length of stay in the ICU, showed significant results in intraoperative MLR with RR: 3.485; 95% CI 1.007-12.057 $p=0.04$.

Conclusion: Intraoperative MLR ≥ 0.2 proved to be a predictor of ICU length of stay ≥ 72 hours.

Keywords: monocyte to lymphocyte ratio, cardiopulmonary bypass, length of stay in ICU