

INTISARI

Latar Belakang: Penyakit kardiovaskular merupakan masalah utama kesehatan dengan prevalensi 1,5% dari penduduk Indonesia. Lebih dari 80% memerlukan prosedur bedah dengan *cardiopulmonary bypass* (CPB) yang dapat menyebabkan komplikasi pada hepar dengan insidensi 0,41-3,7%, dan angka kematian 13,9-52%. Adanya iskemia hepar pasca CPB ditandai dengan peningkatan enzim hepar. Meskipun beberapa penelitian sebelumnya telah mengevaluasi pola perubahan biokimia pemeriksaan hepar serta faktor yang berhubungan, namun masih menunjukkan hasil yang kontradiktif, sehingga masih perlu dilakukan studi lebih lanjut.

Tujuan: Menilai hubungan antara enzim transaminase hepar dan albumin pasca operasi dengan luaran klinis pasien pasca *cardiopulmonary bypass*.

Metode: Desain penelitian ini adalah observasional analitik dengan pendekatan *cross sectional*. Subjek penelitian adalah pasien operasi bedah jantung dengan CPB di RSUP Dr. Sardjito Yogyakarta pada bulan Juli-November 2023. Dilakukan uji korelasi antara AST, ALT, dan albumin pasca operasi dengan lama ventilasi mekanis, lama rawat inap, dan kematian. Nilai $p < 0,05$ dianggap bermakna secara statistik. Uji statistik menggunakan software SPSS versi 23.0.

Hasil: Penelitian melibatkan 50 subjek, yaitu laki-laki (56%) dan perempuan (44%). Median lama ventilasi mekanis 21 (14-372) jam. Median lama rawat inap 7 (3-26) hari. Luaran klinis kematian terjadi pada 7 (14%) subjek. Median parameter pasca operasi, berturut-turut AST 70,5 (32-597) U/L, ALT 18 (8-344) U/L, rasio De Ritis 3,85 (1,33-8,88). Rerata albumin $3,52 \pm 0,41$ g/dL. Terdapat perbedaan antara kadar pra dan pasca operasi pada parameter AST, albumin, dan rasio De Ritis ($p < 0,001$). AST dan albumin memiliki korelasi dengan lama ventilasi mekanis, berturut-turut $r = 0,317$, $p = 0,012$; $r = -0,389$, $p = 0,003$. ALT memiliki korelasi dengan lama rawat inap, $r = -0,268$; $p = 0,030$. AST, ALT, dan albumin menunjukkan perbedaan antara subjek meninggal dengan hidup (berturut-turut $p = 0,002$; $p = 0,003$; $p = 0,013$). ALT memiliki *prevalence ratio* sebesar 6,27 (95% CI: 1,98-19,83; $p = 0,032$) terhadap luaran kematian.

Simpulan: Penelitian ini menunjukkan hubungan antara lama ventilasi mekanis dengan AST dan albumin, serta lama rawat inap dengan ALT, masing-masing dengan kekuatan lemah secara bermakna, serta *prevalence ratio* yang bermakna antara ALT terhadap kematian.

Kata kunci: *cardiopulmonary bypass*, AST, ALT, albumin, rasio De Ritis

ABSTRACT

Background: Cardiovascular disease is a major health problem with a prevalence of 1.5% of the Indonesian population. More than 80% require surgical procedures with cardiopulmonary bypass (CPB) which can cause complications in the liver with an incidence of 0.41-3.7%, and a mortality rate of 13.9-52%. The presence of hepatic ischemia after CPB is characterized by increased liver enzymes. Although several previous studies have evaluated the pattern of biochemical changes in liver examinations and related factors, they still show contradictory results, so further studies are needed.

Objective: To assess the correlation between liver transaminase enzymes and postoperative albumin with clinical outcomes of patients after cardiopulmonary bypass.

Methods: The design of this study was observational analytic with a cross sectional approach. The subjects were cardiac surgery patients with CPB at Dr. Soetomo General Hospital. Sardjito Yogyakarta in July-November 2023. A correlation test was conducted postoperative AST, ALT, and albumin with the duration of mechanical ventilation, length of hospitalization, and mortality. A p value <0.05 was considered statistically significant. Statistical tests used SPSS software version 23.0.

Results: The study involved 50 subjects, namely men (56%) and women (44%). The median duration of mechanical ventilation was 21 (14-372) hours. The median length of hospitalization was 7 (3-26) days. Clinical outcome of death occurred in 7 (14%) subjects. The median postoperative parameters were AST 70.5 (32-597) U/L, ALT 18 (8-344) U/L, De Ritis ratio 3.85 (1.33-8.88). Mean albumin was 3.52±0.41 g/dL. There were differences between pre and postoperative levels in AST, albumin, and De Ritis ratio ($p < 0.001$). AST and albumin were correlated with the duration of mechanical ventilation, respectively $r = 0.317$, $p = 0.012$; $r = -0.389$, $p = 0.003$. ALT was correlated with the duration of hospitalization, $r = -0.268$; $p = 0.030$. AST, ALT, and albumin showed differences between subjects who died and those who lived (respectively $p = 0.002$; $p = 0.003$; $p = 0.013$). ALT had a prevalence ratio of 6.27 (95% CI: 1.98-19.83; $p = 0.032$) to the outcome of death.

Conclusion: This study shows an association between the duration of mechanical ventilation with AST and albumin, and the length of hospitalization with ALT, each with weak strength significantly, and a significant prevalence ratio between ALT and mortality.

Keywords: cardiopulmonary bypass, AST, ALT, albumin, De Ritis ratio