

INTISARI

Latar belakang:

Acute kidney injury (AKI) adalah kondisi penurunan fungsi ginjal akut yang sebabkan komplikasi yang paling umum dan serius pasca operasi *cardiopulmonary bypass* (CPB) karena berkaitan dengan morbiditas dan mortalitas yang meningkat. Diagnosis AKI masih didasari oleh kadar kreatinin serum yang kurang reliabel karena dipengaruhi oleh banyak faktor, seperti usia, jenis kelamin, massa otot, asupan protein, dan obat-obatan. Pemeriksaan albumin serum merupakan pemeriksaan laboratorium yang murah dan mudah dilakukan. Kadar albumin serum yang rendah secara independen berhubungan dengan risiko terjadinya AKI, namun belum banyak penelitian yang dilakukan untuk menilai peranan albumin serum sebagai prediktor AKI pada pasien bedah jantung yang menjalani CPB. Penelitian ini dilakukan untuk mengetahui risiko relatif kadar albumin serum sebagai prediktor terjadinya AKI pada pasien bedah jantung yang menjalani CPB di RSUP Dr. Sardjito Yogyakarta.

Metode:

Penelitian dilakukan secara observasional kohort prospektif. Subjek penelitian adalah pasien operasi bedah jantung yang akan menjalani operasi CPB di RSUP Dr. Sardjito yang memenuhi kriteria inklusi dan eksklusi. Sampel darah tanpa antikoagulan diambil sebelum tindakan CPB untuk pemeriksaan kreatinin *baseline* dan albumin serum, serta 48 jam pasca CPB untuk pemeriksaan kreatinin serum. Albumin serum diperiksa dengan metode kolorimetri. Kriteria AKI menggunakan definisi peningkatan kreatinin $>25\%$ *baseline* atau kenaikan kreatinin absolut 0,5 mg. Analisis utama dengan menilai kurva ROC dan *relative risk* (RR) dengan 95% CI.

Hasil: Sebanyak 77 subjek diikuti dalam penelitian ini dengan 26 pasien (59,1%) mengalami AKI. Dari analisis uji ROC didapatkan nilai *cut off* albumin $\leq 4,45$ mg/dL dengan AUC 0,642 ($p = 0,033$) dalam memprediksi kejadian AKI. Kadar hemoglobin, BUN, GDS, dan lama operasi secara signifikan berbeda pada kelompok dengan albumin serum $\leq 4,45$ mg/dL. IMT, Lama operasi dan albumin serum juga ditemukan signifikan berbeda pada kelompok AKI dan tanpa AKI. Kadar albumin serum $\leq 4,45$ mg/dL bermakna sebagai faktor prediktor kejadian AKI dengan risiko relatif 1,87 ($p = 0,026$; 95% CI: 1,06–3,32).

Simpulan: Pasien bedah jantung metode CPB dengan kadar albumin serum $\leq 4,45$ mg/dL memiliki risiko kejadian AKI 1,87 kali lebih tinggi.

Kata kunci: AKI, albumin serum, penyakit jantung, CPB

ABSTRACT

Background:

Acute kidney injury (AKI) is a condition of acute reduction in kidney function that causes the most common and serious complications after cardiopulmonary bypass (CPB) surgery because it is associated with increased morbidity and mortality. The diagnosis of AKI is still based on serum creatinine levels which are less reliable because they are influenced by many factors, such as age, gender, muscle mass, protein intake and medications. Serum albumin examination is a cheap and easy laboratory examination. Low serum albumin levels are independently associated with the risk of AKI, but not many studies have been conducted to assess the role of serum albumin as a predictor for AKI in cardiac surgery patients undergoing CPB. This research was conducted to determine the relative risk of serum albumin levels as a predictors of AKI in open heart patients undergoing CPB at Dr. Sardjito Yogyakarta.

Method:

The research was conducted as a prospective observational cohort. The research subjects were cardiac surgery patients who would undergo CPB at RSUP Dr. Sardjito who met the inclusion and exclusion criteria. Blood samples without anticoagulants were taken before the CPB procedure to examine baseline creatinine and serum albumin, and 48 hours after CPB to examine serum creatinine. Serum albumin was examined using the colorimetric method. AKI criteria use the definition of an increase in creatinine $>25\%$ baseline or an increase in absolute creatinine of 0.5 mg. The main analysis assessed the ROC curve and relative risk (RR) with 95% CI.

Results:

A total of 77 subjects were included in this study with 26 patients (59.1%) experiencing AKI. From the ROC test analysis, it was obtained that the cut off value for albumin was ≤ 4.45 mg/dL with an AUC of 0.642 (p 0.033) in predicting the incidence of AKI. Hemoglobin levels, BUN, GDS, and operation time were significantly different in the group with serum albumin ≤ 4.45 mg/dL. BMI, duration of operation and serum albumin were also found to be significantly different in the AKI and no AKI groups. Serum albumin levels ≤ 4.45 mg/dL are significant as a predictor factor for AKI with a relative risk of 1.87 (p=0.026; 95%CI: 1.06–3.32)

Conclusion:

CPB cardiac surgery patients with serum albumin levels ≤ 4.45 mg/dL have a 1.87 times higher risk of AKI.

Keywords: AKI, serum albumin, heart disease, CPB