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Preoperative Serum Bicarbonate Levels Predict Acute Kidney Iinjryafter Cardiac Surgery

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Abstract:Background: Cardiac surgery has been associated with impaired renal parenchymal function precisely in the tubular system. This causes Acute Kidney Injury (AKI), which started from the operation and persisted to postoperative in various time span. This decrease in kidney function leads to the accumulation of residual plasma products, such as urea and creatinine. Metabolic acidosis characterized by decreased serum bicarbonate concentration is thought to play a role in the pathogenesis of renal injury. Acidosis worsens renal tubular damage by increasing the production of ammonia in the renal tubular, which activates the complement system and triggers tubulointerstitial damage in the kidneys.**Methods:**This retrospective cohortstudy of 103 patientsunderwentcoronary artery bypass graft (CABG) or valve surgery at the Haji Adam Malik General Hospital from January 2017 to December 2017. All patients will be examined for preoperative and postoperative laboratory. The patients were divided into 3 groups based on preoperative serum bicarbonate level, which represented group 1 (below normal levels) <22 mEq/L; group 2 (normal levels) 22 to24 mEq/L, and group 3 (elevated levels) > 24 mEq/L. Then the patient will be followed during hospitalization. Then conducted analysis to see association between serum bicarbonate level and incidence of cardiac surgery-associated acute kidney injury (CSA-AKI).**Results:** CSA-AKI was more common in group 1 compared to group 2 and 3. CSA-AKI developed in 26 patients (65%) in group 1, 11 patients (27.5%) in group 2, and 3 patients (7.5%) in group 3 (P = 0.022). Multivariate analysis showed that serum bicarbonate <22 mEq/L was the most dominant risk factor affecting the incidence of CSA-AKI [OR 6.99 (1.68-29.15), p = 0.008].**Conclusion:**Low serum bicarbonate levels (<22 mEq/L) is a strong predictor of the incidence CSA-AKI with OR 6.99.
Keywords: serum bicarbonate, AKI, cardiac surgery.

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