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# Hypoalbuminemia is related with worse kidney outcomes and mortality after coronary artery bypass graft surgery

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**Objectives:** Hypoalbuminemia reflects several pathologic conditions such as nutritional deficiency and chronic inflammation. However, its relationships with kidney outcomes and a long-term mortality after coronary artery bypass grafting (CABG) remain unresolved.

**Methods:** A total of 3,040 patients who underwent CABG at three tertiary referral hospitals between 2003 and 2015 were retrospectively reviewed. Patients were categorized by quartiles of preoperative albumin levels. Odds ratio (OR) for postoperative acute kidney injury (AKI) and hazard ratio (HR) for end-stage renal disease (ESRD) and all-cause mortality were calculated after adjustment of multiple covariates.

**Results:** Mean preoperative albumin level was 3.8 ± 0.6 g/dL. The prevalence of postoperative AKI was 34.4%, 30.1%, 24.4%, and 19.8% from 1$^{st}$ to 4$^{th}$ quartiles, respectively. The 1$^{st}$ quartile had higher risks of AKI (adjusted OR, 1.4 [1.04–2.00]) and ESRD (adjusted HR, 3.1 [1.02–9.31]) than the 4$^{th}$ quartile. During the mean follow-up period of 6 years (maximum 13 years), 854 patients (25.9%) died. The 1$^{st}$ quartile had a higher risk of mortality than the 4$^{th}$ quartile with an adjusted HR of (1.7 [1.23–2.20]).

**Conclusions:** Because hypoalbuminemia is associated with AKI, ESRD, and all-cause mortality, serum albumin levels should be monitored during the perioperative period of CABG.

Table. Odds ratio of acute kidney injury according to the albumin levels

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| | | | Univariate | | Multivariate* | |
|---|---|---|---|---|---|---|
| Albumin groups | Range (g/dL) | Events (%) | OR (95% CI) | *P* | OR (95% CI) | *P* |
| 4th quartile | ≥ 4.3 | 19.8 | 1 (Reference) | | 1 (Reference) | |
| 3rd quartile | 3.9 to 4.2 | 24.4 | 1.33 (1.047–1.687) | 0.019 | 1.21 (0.940–1.552) | 0.139 |
| 2nd quartile | 3.4 to 3.8 | 30.1 | 1.79 (1.398–2.280) | < 0.001 | 1.40 (1.067–1.841) | 0.015 |
| 1st quartile | ≤ 3.3 | 34.4 | 2.16 (1.708–2.739) | < 0.001 | 1.44 (1.043–1.996) | 0.027 |

OR, odds ratio; CI, confidence interval.

*Adjusted for age, sex, body mass index, smoking, alcohol, systolic and diastolic blood pressures, hypertension, diabetes mellitus, history of myocardial infarction and cerebrovascular event, peripheral vascular disease, medications such as angiotensin-converting enzyme inhibitors or angiotensin receptor blockers, β-blockers, diuretics, and statins, history of coronary angiography within 1 week before surgery, perioperative use of an intra-aortic balloon pump, left ventricular ejection fraction, estimated glomerular filtration rate, and blood findings such as white blood cell count and hemoglobin.