

中文題目：低白蛋白會增加顯影劑電腦斷層檢查後之急性腎損傷的風險

英文題目：Hypoalbuminemia was associated with an increased risk of acute kidney injury after contrast-enhanced computerized tomography

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**Background:** Post-contrast acute kidney injury (PC-AKI) is well known to be associated with considerable morbidity and mortality. Moreover, PC-AKI may be associated with development of chronic kidney disease and potential progression to end-stage kidney disease. PC-AKI involves a complex interplay of many factors, estimated glomerular filtration rate (eGFR) currently being the mainstay of risk assessment. Recently, our group has reported that hyperuricemia may have potential as an independent risk factor for acute kidney injury (AKI) in patients receiving contrast-enhanced image study. Albumin is quantitatively the most important plasma protein. Albumin is not only a major factor for the maintenance of intravascular oncotic pressure; it also has a role as a transport protein. Albumin synthesis is regulated by a variety of factors, including stress, nutritional status, serum oncotic pressure, cytokines, and hormones. The aim of this study is to determine whether hypoalbuminemia correlated with renal outcome after contrast-enhanced computerized tomography (CCT).

**Methods:** A historical cohort of 20018 non-dialysis adult patients in our tertiary medical center who had received nonionic iso-osmolar CCT from 1 June 2008 to 31 March 2015 was enrolled to investigate the association of serum albumin and renal outcome after CCT. Patients with pre-existing AKI, multiple exposures, non-standard volume of contrast, and missing data for analysis were excluded. We then divided these patients into three groups according to their serum albumin levels: Very low albumin group (serum albumin <3.0 g/dL), low albumin group (3.0 ≤serum albumin <3.5 g/dL), and normal albumin group (serum albumin ≥3.5 g/dL). The renal outcome of this study was determined by the primary and secondary endpoints. The primary renal endpoint was PC-AKI. PC-AKI was defined by absolute increase of serum creatinine ≥0.3 mg/dL from baseline within 48 hours or ≥50% within seven days after CCT, the Kidney Disease Improving Global Outcomes (KDIGO) criteria of AKI. Considering the urine volume was not regularly collected, we did not include the criteria of urine volume of KDIGO criteria of AKI in this study. The secondary endpoint studied was the need of emergent hemodialysis within 30 days after CCT, which was identified by the first procedure of hemodialysis within 30 days after CCT.

**Results:** Totally, 7495 patients were enrolled for the analysis. PC-AKI occurred in 852 (11.4%) patients and the need of hemodialysis within 30 days developed in 411 (5.5%) patients. Both the

incidences were increased in patients with decreased serum albumin. The incidence of PC-AKI was 17.1% in the very low albumin group, 13.4% in the low albumin group and 6.4% in the normal albumin group ( $P < 0.001$ ). The incidence of dialysis was 9.4%, 5.2%, 2.9% in the three groups respectively,  $P < 0.001$ . Serum albumin  $< 3.0$  g/dL was associated with an increased risk of PC-AKI (Odds ratio (OR) of 1.74; 95% confidence interval (CI), 1.49-2.03,  $P < 0.001$ ) and need of hemodialysis within 30 days (OR, 1.79; 95% CI, 1.41-2.29,  $P < 0.001$ ). Besides, both PC-AKI and dialysis within 30 days after CCT increased the mortality rate in patients with serum albumin  $< 3.0$  mg/dL (for PC-AKI, 46.4% vs. 21.2%; for dialysis within 30 days, 41.5% vs. 23.8% (both  $P < 0.001$ )).

**Conclusion:** Our findings provide novel insight that hypoalbuminemia, especially  $< 3.0$  mg/dl, is an independent risk factor for AKI and need of dialysis in patients undergoing CCT. We suggest obtaining serum albumin may augment eGFR when estimating risks of PC-AKI prior to CCT. In an era of patient-centered medicine and shared decision making, accurate risk assessment before CCT cannot be overstated. However, further research is need to elucidate whether intravenous albumin supplementation in patients with hypoalbuminemia before CCT may decrease PC-AKI or need of dialysis.