

中文題目：加護病房病人接受顯影劑電腦斷層檢查後發生急性腎損傷的風險

英文題目：Risk of acute kidney injury after contrast-enhanced computerized tomography in intensive care unit patients

作者：洪秉鴻¹，吳軍毅²，蔡尚峰³，吳明儒¹

服務單位：¹臺中榮民總醫院內科部，²臺中榮民總醫院內科部一般醫學內科，³臺中榮民總醫院內科部腎臟科

Background: Contrast enhanced computerized tomography (CCT) is frequently performed in intensive care unit (ICU) patients. The risk of post-contrast acute kidney injury (PC-AKI) after CCT is not fully clarified in intensive care unit (ICU) patients. In this study, we aim to determine the association of CCT with the subsequent development of PC-AKI, emergent dialysis, and short-term mortality using a cohort of ICU patients who underwent CCT.

Methods: This cohort study was conducted in ICU patients who had received nonionic iso-osmolar CCT between 1 June 2008 and 31 March 2015 in a tertiary referral Medical Center. The non-ICU hospitalized patients were enrolled to compare the risk. Patients with multiple contrast exposures, pre-existing acute kidney injury (AKI) and missing data for analysis were excluded. The renal outcome of this study was PC-AKI and emergent dialysis with 30 days after CCT. PC-AKI was defined as the criteria of Kidney Disease Improving Global Outcomes (KDIGO) for AKI, which is absolute increase of serum creatinine ≥ 0.3 mg/dL from baseline within 48 hours or $\geq 50\%$ within seven days after CCT. However, the urine volume was not available in this study. Thus, we failed to include the criteria of urine volume of KDIGO criteria to determine AKI. The second renal outcome 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, 1349 ICU patients (aged 64.7 ± 17.3 years) and the other 10922 non-ICU inpatients (aged 64.7 ± 16.4 years) were enrolled. PC-AKI occurred in 264 (19.6%) patients, while only 915 (8.4%) in non-ICU hospitalized patients ($P < 0.001$). The need of emergent hemodialysis within 30 days developed in 164 (12.2%) of patients, while only 376 (3.4%) in non-ICU hospitalized patients ($P < 0.001$). When compared to non-ICU hospitalized patients, the 30-days mortality rate after CCT was significantly higher in ICU patients, 18.8% vs. 9.3% ($P < 0.001$). When ICU patients developed PC-AKI, their mortality rate was increased from 13.5% to 40.5% ($P < 0.001$). The trend was similar in patients who need to receive dialysis within 30 days after CCT. When ICU patients developed emergent dialysis within 30 days after CCT, their mortality rate was increased from 16.1% to 38.4% ($P < 0.001$). Multivariate regression analysis showed that higher estimated glomerular filtration rate (eGFR), shock and hyperbilirubinemia could predict PC-AKI after CCT in ICU patients, while higher eGFR, hypoalbuminemia and hyperkalemia could predict

the need of emergent dialysis within 30 days after CCT (all $P < 0.01$).

Conclusion: Our results presented the incidence of PC-AKI and the need of emergent dialysis within 30 days after CCT in the ICU setting. Either PC-AKI or the need of emergent dialysis attribute to higher mortality rate in the patients with ICU care. We suggest that critical care doctors should aware the high incidence of renal event after CCT 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.