

Preoperative renal function stratification and early cardiac ICU adverse events in coronary artery disease

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Introduction

Patients with chronic kidney disease (CKD) presenting for cardiac surgery, often display comorbid diseases and varying degree of adverse events in the peri-operative setting (1). In this group of patients, association of CKD and complications during cardiac ICU (CICU) stay are not well-defined. The objective of this investigation was to evaluate early postoperative complications in CICU among patients with normal or mild decrease of renal function versus those with CKD (moderate to severe kidney dysfunction).



Methods

We retrospectively analyzed data from 598 consecutive patients admitted to cardiac ICU after elective isolated coronary artery bypass grafting procedures from June 2012 to March 2014. Patients on renal dialysis, those undergone urgent or emergent surgery, or those suffered from preexisting arrhythmia were excluded prior to the study. Estimated GFR (eGFR) was calculated by the MDRD equation for each patient. An eGFR of less than $60 \text{ mL} \cdot \text{min}^{-1} \cdot 1.73 \text{ m}^{-2}$ was considered the threshold for CKD. Early postoperative outcomes included re-intubation, pneumonia, acute kidney injury (AKI), renal failure requiring dialysis (RD), multiple organ dysfunction syndrome (MODS), new onset atrial fibrillation (AF) and in-hospital mortality. Chi-square test and Student's t-test were used for statistical analysis ($p < 0.05$).

Results

The threshold of CKD occurred in 165 patients (27.6%; Group 2) while 433 patients presented normal or mild deterioration of renal function (72.4%; Group 1). The mean age of Group 1 and Group 2 was 63.2 ± 10.6 and 69 ± 8.4 years, respectively. Patient with CKD had higher re-intubation rate and incidence of pneumonia, AKI and RD (Table).

There is no statistical significance regarding MODS and AF between the groups. Incidence of in-hospital mortality was less in Group 1.

N = 598	Group 1 (n=433)	Group 2 (n=165)	P value	Relative Risk
Pneumonia	2 (0.5%)	5 (3%)	<0.01	6.545
Re-intubation	3 (0.7%)	7 (4.2%)	<0.01	6.123
AKI	50 (11.5%)	38 (23%)	<0.01	1.994
Renal Dialysis	5 (1.2%)	6 (3.6%)	0.04	3.149
MODS	4 (0.9%)	5 (3%)	0.06	3.280
AF	107 (24.7%)	51 (30.9%)	NS	1.251
Mortality (%)	0.9	3.7	0.02	3.951

Conclusions

According to our results, patients with moderate to severe renal dysfunction undergoing open-heart surgery for coronary disease show increased postoperative morbidity and mortality. Therefore, preoperative stratification according to renal function is required to adopt renal protection strategies in an effort to avoid postoperatively potential deleterious adverse events.



References

(1) Eilers H, Liu KD, Gruber A et al. Chronic kidney disease: implications for the perioperative period. MINERVA ANESTESIOLOGICA 2010; 76(9):725-736.