

Proteinuria is a Risk Factor for Acute Kidney Injury after Cardiac Surgery in Patients with Stage 3-4 Chronic Kidney Disease: A Case-Control Study

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Introduction

Acute Kidney Injury (AKI) is a common complication after cardiac surgery, and preoperative renal dysfunction is an important risk factor. Proteinuria indicates renal structural damage, but there is less research on the risk of proteinuria and AKI after cardiac surgery in patients with renal dysfunction. This study aims to clarify whether proteinuria can predict AKI after cardiac surgery in patients with renal dysfunction.

Methods and Materials

Patients with stage 3-4 Chronic Kidney Disease (CKD) undergoing cardiac surgery were included in this retrospective study. AKI was defined according to KDIGO criteria. The main study was the relationship between proteinuria and AKI in patients with stage 3-4 CKD.

Results

The entire cohort (n=1546) had an AKI incidence of 53.55%. The in-hospital mortality rate of patients with AKI was higher than that of patients without AKI (AKI vs. no AKI, 4.7 vs. 0.8%, P<0.001). Multivariable logistic regression analysis showed that proteinuria is an independent risk factor for AKI (Trace-1+ OR=2.37; 2+-3+ OR=5.16) and AKI requiring renal replacement therapy (Trace-1+ OR=3.64; 2+-3+ OR= 5.71). Mild proteinuria (Trace-1+ OR=2.59) is also an independent risk factor for in-hospital mortality. In diabetic patients, mild proteinuria (OR=1.925) rather than severe proteinuria (2+-3+) is a risk factor for AKI in patients with renal dysfunction and diabetes. **(Table 1)**

Conclusions

In populations with renal dysfunction, the incidence of AKI is high, which seriously affects renal function and overall prognosis. Preoperative proteinuria, as a simple and inexpensive routine examination, still has value in predicting AKI in patients with impaired renal function.

Table 1. Logistic regression of risk factors for AKI in diabetic subgroup

	Univariate analysis			Multivariate analysis		
	OR	95%CI	P value	OR	95%CI	P value
Baseline laboratory indices						
Hemoglobin (g/L)	0.973	0.958–0.988	<0.001	0.977	0.961–0.993	<0.001
Albumin (g/L)	0.907	0.850–0.967	0.003	0.932	0.871–0.997	0.04
Proteinuria						
0	1			1		
Trace-1+	2.336	1.296–4.212	0.005	1.925	1.028–3.602	0.041
2+-3+	4.176	1.141–15.283	0.031			NS

AKI: Acute kidney injury CI: Confidential interval; NS: Not Significant



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