Renal recovery in cardiac surgery patients requiring postoperative renal replacement therapy

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Objective: Renal failure after cardiac surgery is associated with increased morbidity and mortality. There is a lack of data examining the rate of renal recovery after patients have started dialysis following cardiac surgery. We aimed to determine the time to renal recovery of patients requiring dialysis after cardiac surgery.

Methods: All patients that developed new-onset renal failure requiring dialysis following cardiac surgery at our institution from 2011-2022 were included. A retrospective chart review 1 year postoperatively was performed and identified the following outcomes, which were merged with each patient's STS ACSD file: renal recovery, time to renal recovery, and mortality at one year. Kaplan-Meier analysis was used to predict time to renal recovery, censoring patients who died or were lost to follow up. Univariate analysis between baseline demographics, comorbidities, intraoperative factors, postoperative complications, and renal recovery was performed. Those with p values < 0.1 and clinically relevant variables were considered for inclusion in multivariable analysis. Cox regression was used for risk-adjustment.

Results: A total of 312 patients were included in the final analysis. Mortality during index hospital admission was 33% (n=105), and mortality at one year was 35% (n=110). Of those surviving at one year, 67% (n=136) remained renally recovered, 12% (n=25) were known to be on dialysis (Figure). Median renal recovery time was 45 (27-62) days. Cox regression showed that increasing age (HR 0.978, CI 0.961-0.989, p=0.001), increasing postoperative creatinine (HR 0.871, CI 0.784-0.966, p=0.011), postoperative pneumonia (HR 0.652, CI 0.442-0.986, p=0.042), and total units postoperative PRBC use (HR 0.952, CI 0.931-0.972, p <0.001) were negative predictors of renal recovery.

Conclusion: 67% of renal failure patients who survived the peri-operative period had renal recovery within 1 year after surgery. Recovery was driven primarily by post-operative complications rather than comorbidities and intraoperative factors. This suggests that renal failure in the post-operative cardiac surgery patient who survives to discharge is unlikely to be permanent.

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