

Clinical Profile of Acute Kidney Injury after Heart Transplant

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- The definition of AKI has undergone a significant evolution, moving from the RIFLE and AKIN criteria to the more comprehensive KDIGO classification.
- Cardiac transplantation carries a substantial risk of acute kidney injury (AKI), with reported incidences varying widely from 14% to 76%.
- This significant variability underscores the need for further research to identify specific patient factors and optimize preventive strategies.
- This study on acute kidney injury (AKI) in heart transplant recipients is novel as we perform a high number of heart transplants in Narayana Health and due to an overall lack of data in the Indian subcontinent.

Methods

- Aim -To analyze the clinical spectrum of acute kidney injury after heart transplant.
- Study Design – Retrospective + prospective observational study
- Sample size – 45
- Study Duration –2008 - 2024
- Inclusion Criteria -Adult patients of 18 years age or older who have undergone cardiac transplantation.
- Exclusion Criteria- Patients less than 18 years of age and who have undergone multiorgan transplant

BASELINE CHARACTERISTICS PRIOR TO TRANSPLANT

	ALL (N=45)	NO AKI (N=11)	AKI WITH NO RRT (N=17)	AKI WITH RRT (N=17)	p VALUE
Age	38.8	30.9	45.23	39.47	0.086
Male	41 (91.1%)	9 (81.8%)	15 (88.2%)	17 (100%)	0.272
BMI (mean)	22.48	21.45+/- 4.5	22.7±2.5	22.9 ±2.9	0.488
DIAGNOSIS					
Arrthmogenic right ventricular dysplasia	2 (4.4 %)	1 (9.1%)	1 (5.8%)	0	0.708
Congenital heart disease	5 (11.1%)	0	2 (11.8%)	3 (17.6%)	0.417
Dilated cardiomyopathy	16 (35.5 %)	4 (36.4%)	8 (47.1%)	4 (23.5 %)	0.357
Ischaemic cardiomyopathy	18 (40%)	4 (36.4%)	6(35.3%)	8 (47.1%)	0.752
Restrictive cardiomyopathy	4 (8.8%)	2 (18.2%)	0	2 (11.8%)	0.122
COMORBIDITIES					
Hypertension	8 (17.8 %)	0	4 (23.5%)	4 (23.5 %)	0.18
Diabetes mellitus	10 (22.2%)	2 (18.2%)	6 (35.3%)	2 (11.8%)	0.239
Chronic Kidney Disease	6 (13.3 %)	0	2 (11.8%)	4 (23.5 %)	0.21
Smoking	4 (8.9 %)	0	2 (11.8%)	2 (11.8%)	0.659
Baseline eGFR	92.74	104.6	86.7	91.1	

TRANSPLANTATION CHARACTERISTICS	ALL (N=45)	NO AKI (N=11)	AKI WITH NO RRT (N=17)	AKI WITH RRT (N=17)	p VALUE
INDUCTION					
ATG	9 (20%)	3 (27.3%)	5 (29.4%)	1 (5.9%)	0.181
Basiliximab	33 (73.3%)	8 (72.7%)	11(64.7%)	14 (82.2 %)	0.508
Nil Induction	3 (6.7 %)	0	1(5.9%)	2 (11.8 %)	0.776
INOTROPIC MEDICATIONS					
Dobutamine	27 (60%)	4 (36.4%)	10(58.8%)	13 (76.4%)	0.106
Dopamine	19 (42.2 %)	7 (63.6%)	5 (29.4%)	7 (41.2%)	0.199
Epinephrine	38 (84.4 %)	6 (54.5%)	16(94.1%)	16 (94.1%)	0.007
Norepinephrine	24 (53.3%)	9 (81.8%)	7(41.2%)	8 (47.1%)	0.0878
Milrinone	13 (28.9 %)	3 (27.3%)	4(23.5%)	6 (35.3%)	0.744
Vasopressin	7 (15.6 %)	2 (18.2%)	2(11.8%)	3 (17.6 %)	0.861

TRANSPLANTATION CHARACTERISTICS	ALL (N=45)	NO AKI (N=11)	AKI WITH NO RRT (N=17)	AKI WITH RRT (N=17)	p VALUE
INTRAOP TRANSFUSIONS					
PRBC	2.9	0.75	3.6	3.3	
Platelet	3.2	1	4.4	3.4	
FFP	3.4	1.75	3	4	
Cryoprecipitate	4.4	0	3.4	6.6	
INTRAOP ECMO	7 (15.6 %)	0	1 (5.9%)	6 (35.3%)	0.022
REOPERATION FOR BLEEDING	6 (13.3 %)	0	0	6 (35.3 %)	0.005
SEPSIS	13 (28.9 %)	1 (9.1%)	5 (29.4%)	7 (41.2 %)	0.214
PRIMARY GRAFT DYSFUNCTION	5 (11.1%)	0	0	5 (29.4 %)	0.019
CARDIOPULMONARY BYPASS TIME (MIN)	186.5	181.1± 27.3	183.5±44.8	193.1±74.8	0.828
CROSS CLAMP TIME (MIN)	123.5	116.5± 37.4	128.4±51	123.2±72.6	0.874
DONOR HEART ISCHAEMIA TIME (MIN)	137.4	147.4± 41	132±40.1	131.3±27.8	0.64
PEAK CNI LEVEL (TACROLIMUS)-ng/ml	11.7	10.4	10.2	14.6	0.518
MORTALITY					
TOTAL HOSPITAL STAY DAYS (MEAN)	40.5	32.3	43.6	42.7	0.607
30 DAYS MORTALITY	7 (15.6%)	0	0	7 (41.2%)	0.0012
1 YEAR MORTALITY	9 (20%)	1 (2.9%)	0	8 (47.1%)	0.0008

Conclusion

- This study underscores the significant burden of AKI following heart transplantation.
- Our findings highlight the importance of identifying high-risk patients and implementing preventive strategies to minimize the development and severity of AKI.
- Future research should focus on developing risk stratification models and investigating potential therapeutic interventions to improve long-term outcomes for heart transplant recipients.