Risk Factors For Delayed Graft Function In Deceased Donor Kidney Transplantation: Is Intra-Operative Thymoglobulin Preventive?

Neda Naderi [1, 2], Mohammad reza Khatami[1], Mahboob lessan-pezeshki[1], Simin Dashti-Khavidaki[1], Azam Alamdari[1], Armin Safdarpour[1], Hamid Moradi[2]

1. Nephrology Research Center, Tehran University of Medical Sciences, Tehran, Iran.

2. Harold Simmons Center for Kidney Disease Research and Epidemiology, Division of Nephrology and Hypertension, University of California, Irvine, CA, United States.

INTRODUCTION

- Delayed graft function (DGF) is associated with significant adverse events in deceased donor kidney transplantation including lower graft survival and still remains a major barrier to improved outcomes.
- DGF has a multi-factorial etiology. Brain death induces micro-vascular vasoconstriction, thrombosis and inflammation, exacerbated by ischemic injury during retrieval.
- Risk factors and potential preventive strategies like intraoperative thymoglobulin (ATG) have not yet been fully evaluated.
- ATG can be recommended as a protective factor when used as an induction therapy.

METHODS

- We retrospectively examined medical records of 182 first time cadaveric kidney transplant recipients from two major kidney transplant centers from 2014 to 2016.
- All the donors were standard heart beating-brain death donors and all donated kidneys were preserved by standard cold storage technique.
- DGF was defined as "the need for dialysis within the first week after transplantation".
- Pre-emptive kidney transplant recipients were excluded. Risk factors for DGF in remaining recipients (n=163) were evaluated using multivariate logistic regression analysis.

RESULTS

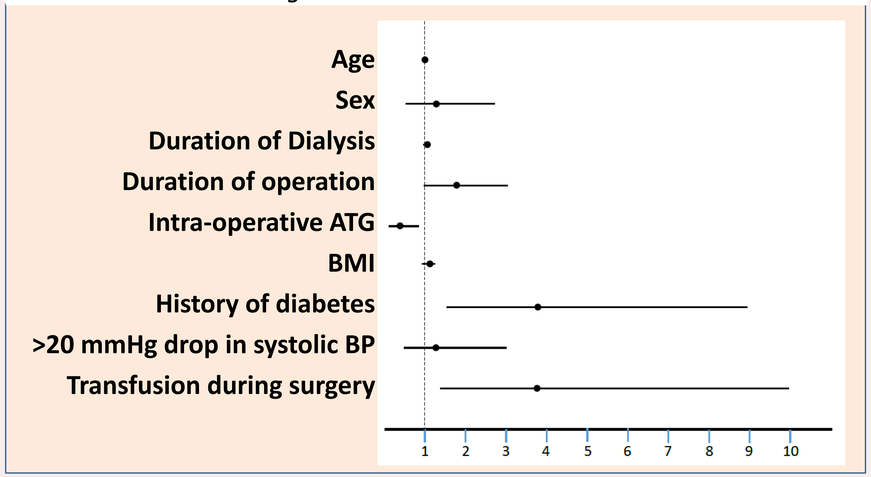
- The mean age was 43±13 years and the majority of participants were male (64%).
- The rate of intraoperative blood transfusion was 16%.
- **The overall rate of DGF was 24.2% (n=182).**
- The rate of DGF in recipients with prior history of dialysis was 27.0% (n=163).
- Mean serum creatinine at discharge and length of hospital stay were significantly higher in patients with DGF compared with those without DGF (2.5 vs. 1.4 mg/dl and 25 vs. 14 days, respectively).
- **Intra-operative ATG was significantly associated with a lower rate of DGF** (adjusted odds ratio [AOR], 0.33, 95% CI, 0.11-0.95).
- **Intra-operative transfusion** (AOR, 3.7, 95% CI, 1.4-9.9) and **diabetes mellitus** (AOR, 3.7, 95% CI, 1.5-8.9) were significantly associated with **higher risk of DGF**.
- There was no statistically significant association between DGF and recipients' age, sex, body mass index or duration of pre-transplant dialysis.

Table 1- Demographic and clinical characteristics of study population

DGF-Related Factors	Delayed Graft Function		
	No (138)	Yes (44)	P
Age (y/o)	42.6±13.82	45.5±12.80	0.223
Age ≥ 65	6 (4.3%)	1 (2.3%)	0.533
Sex (Male)	89 (64.5%)	27 (61.4%)	0.707
BMI (Kg/m^2)*	23.7 ±3.77	24.7±4.08	0.161
BMI ≥ 30	8 (5.8%)	7 (15.9%)	0.034
Duration of dialysis (months)	23.6±26.84	24.4±22.73	0.848
Operation duration (hours)	3.32±0.80	3.42±1.00	0.518
Hospitalization duration (days)	14.2±5.58	24.9±15.45	<0.001
Serum creatinine at discharge (mg/dl)	1.42±0.39	2.5±1.68	<0.001
Intra-operative ATG**	70 (50.7%)	20 (45.4%)	0.543
ATG dose (mg/Kg)	2.94±2.61	5.36±1.71	<0.001
History of hypertension	94 (68.1%)	34 (77.3%)	0.247
History of Diabetes mellitus	27 (19.6%)	22 (50%)	<0.001
>20 mmHg drop in systolic BP	29 (21.0%)	12 (27.3%)	0.387
Transfusion during surgery	16 (11.6%)	13 (29.5%)	0.005
Pre-emptive transplantation	19 (13.8%)	0 (0%)	0.009

*Body Mass Index, **Thymoglobulin

Graph 1- Adjusted odds ratios and confidence intervals for development of DGF in the final multivariate regression model



CONCLUSIONS

- This study showed that intra-operative blood transfusion and diabetes mellitus were independent risk factors for the development of DGF.
- Meanwhile, administration of intra-operative ATG was associated with a reduced odds ratio of DGF.
- Future studies are needed to evaluate the potential role of ATG in DGF-related renal outcomes.

Correspondence: Neda Naderi, MD
Email: naderi_neda@yahoo.com