

A single-center comparison of 22 competing definitions for delayed graft function after kidney transplantation

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INTRODUCTION AND AIMS

- **Delayed graft function (DGF)**
 - an early complication following kidney transplantation
 - due to ischemia/reperfusion injury
 - impact on early as well on long-term graft outcomes
- **No consensus** and no golden standard **how to define DGF**
- **Most used definition: need for dialysis within the first week following transplantation**
- **This study compares 22 different definitions for DGF**

METHODS

- **Retrospective cohort study**
 - including **497 adult kidney transplantations** from deceased donors between 2005-2011
 - mean follow-up of 5.1 years
- **Survival analysis:** Kaplan-Meier plots, log-rank tests and Cox proportional hazards models
- Graft failure-related **sensitivity** and **specificity**

RESULTS

Definition	DGF (%)	Failure (%) no DGF/DGF	Se (%)	Sp (%)	HR (95% CI)	Cox
Based on dialysis						
Need for dialysis in the first week post-transplant	12	4 / 11	29	88	3.61 (1.38-9.42)	0.009
Need for dialysis in the first week post-transplant once hyperacute rejection, vascular and urinary tract complications were ruled out	12	4 / 10	25	89	2.87 (1.05-7.86)	0.04
Need for dialysis post-transplant	13	4 / 11	28	88	3.37 (1.29-8.84)	0.013
Need for dialysis in the first 10 days post-transplant	13	4 / 11	29	88	3.45 (1.32-9.01)	0.012
Absence of life-sustaining renal function that requires dialysis on two or more occasions within the first week post-transplant	9	4 / 16	29	92	6.12 (2.33-16.06)	<0.001
Need for dialysis in the first 7 days post-transplant with specific exclusion of single early post-operative dialysis performed for hyperkalemia	12	4 / 12	29	89	4.03 (1.56-10.4)	0.004
Return to maintenance hemodialysis within the first 4 days post-transplant	4	4 / 29	25	97	13.73 (4.76-39.6)	<0.001
Based on serum creatinine levels (SCr)						
SCr increased or remained unchanged or decreased <10%/day during 3 consecutive days post-transplant	54	3 / 6	67	47	1.92 (0.8-4.58)	0.14
Creatinine reduction ratio on day 2 post-transplant (CRR2) <30%	43	4 / 6	50	57	1.22 (0.52-2.88)	0.64
Time required for the kidney to reach CrCl >10 mL/min greater than 1 week	9	4 / 11	21	92	3.85 (1.31-11.3)	0.014
Failure of SCr to decline in the first 48 h in the absence of rejection	11	4 / 9	21	90	2.60 (0.92-7.33)	0.07
SCr >2.5 mg/dL on day 7	25	4 / 8	42	75	2.66 (1.1-6.4)	0.03
Failure of SCr to fall below pre-transplant levels within 1 week regardless of UO	4	5 / 5	4	96	1.17 (0.15-9.03)	0.88
Based on urine output (UO)						
UO <630 ml in the first 24 h	5	4 / 20	21	96	5.66 (1.97-16.26)	0.001
Based on a combination						
SCr >2.5 mg/dL on day 7 or the need for post-transplant hemodialysis	27	4 / 8	42	74	2.46 (1.02-5.93)	0.046
Patients with rise in SCr at 6-8 h post-operatively or <300 cc of urine despite adequate volume and diuretics	21	4 / 10	42	80	2.61 (1.11-6.16)	0.028
Dialysis requirement post-transplant or a SCr >150 µmol/L at day 8	41	3 / 7	62	60	2.92 (1.2-7.08)	0.018
UO <1 L in 24 h and <25% fall in SCr from baseline in first 24 h post-transplant	8	4 / 10	17	92	2.55 (0.83-7.83)	0.10
UO <75 mL/h in first 48 h or failure of SCr to decrease by 10% in the first 48 h	26	4 / 7	38	75	2.04 (0.84-4.96)	0.12
Need for dialysis in the first week post-transplant or failure of SCr to decrease within 24 h post-transplant	19	4 / 10	38	82	2.64 (1.1-6.31)	0.029
≥ 2 dialysis sessions or a CRR2 of <25% within the first 48 h post-transplant	40	4 / 6	46	60	1.18 (0.49-2.86)	0.71
UO <630 ml in the first 24 h and SCr >2.5 mg/dL on day 7	5	4 / 22	21	96	6.53 (2.28-18.68)	<0.001

CONCLUSIONS

- **The most used definition is still very usable** if one can settle for low sensitivity
- **Some definitions combining the need for dialysis and serum creatinine are able to detect a larger group of recipients with an increased risk of graft failure**

