¿Which peritransplant features can predict graft survival in donor after circulatory death kidney transplantation?

¿Qué factores peritrasplante pueden predecir la supervivencia del injerto en el trasplante renal de donante en asistolia?

Dear Editor:

Due to organ shortages, kidney transplantation (KT) from donors with expanded criteria (ECD) and donation after asystole (AD) has increased in recent years.

The impact of different times of ischemia during donation and donor and recipient characteristics on graft survival in AD have been poorly studied. In the present study, we analyze which peri-transplant factors can predict graft survival in our AD KT program.

This analysis included prospectively the data of all controlled AD KTs performed at the Son Espases University Hospital from June 2016 to November 2019. Renal extraction was performed by the ultra-rapid technique, the preservation method was cold storage, and the preservation solution was Wisconsin® fluid. The immunosuppression induction protocol included antithymocyte globulin or basiliximab, while steroids, tacrolimus and mycophenolate or everolimus were used during maintenance.

During the study period, there were 86 KTs were performed from controlled AD (Table 1). At the time of analysis, the median follow-up after transplantation was 2.3 years.

Graft and patient survival were similar to other published data at three years of follow-up.[1,2]

Our donors and recipients were older than those in other studies.[1] However, some countries reject a high percentage of aged donor kidneys, which could explain this difference. Likewise, our results showed no differences between recipients with graft survival and graft loss, as in a recent Spanish study[3] (Table 2). Additionally other longitudinal records such as the cohort from Eurotransplant, UNOS, and US data, showed a relationship between donor and recipient age and graft loss.[4,5] In our study, 68% of donors met the expanded criteria, a higher rate than in other studies[3,6]; however, this characteristic was not associated with graft loss (Table 2). In addition, ECDs were more common in the group with graft loss. Some studies, such as in the U.S., found no differences between ECDs and non-ECDs with respect to graft survival,[5] while others did.[2,3,7] However, it should be noted that most of the studies mentioned were retrospective and combined both static and perfusion machine cold storage systems, as well as their increased number of rejected ECDs.[7]

Different results have been published on the effect of the duration of hot ischemia. The Eurotransplant cohort revealed an association with graft loss, while the UK cohort did not.[1] Our data showed that functional hot ischemia time (f-HIT) was not associated with graft loss (Table 2). However, the f-HIT in the graft loss group was longer than in the graft survival group, but without statistical significance. On the other hand, cold ischemia time (CIT) has been strongly associated to graft loss in DA KT.[8] Our data did not show this association. It is worth noting that, in our registry, the CIT was shorter than that described by other centers[9] and that this favorable CIT

Table 1 – Descriptive data.

Donors (n 50)	
Age (median)	63 (56-68)
Males	35 (75,6%)
Female	15 (24,4%)
Expanded Criteria	34 (68%)
Recipients (n 86)	
Age (median)	61 (52-66.3)
Males	67 (77.9%)
Females	19 (22.1%)
Diabetes Mellitus	32 (37.2%)
BMI	27.1 +/- 4.5
Peritoneal Dialysis	24 (27.9%)
Hemodialysis	50 (58.1%)
Anticipated	12 (14%)
Previous transplant	12 (14%)
Residual diuresis:	
<500 mL/d	34 (39.5%)
500–1000 mL/d	17 (19.8%)
>1000 mL/d	35 (40.7%)
Ischemia times (median, IQR, minutes)	
LET - CRA	15 (11-18)
Functional f-HIT	19 (14-22)
CRA - perfusion	9 (7.3-10.8)
CIT	540 (375-1125)
Results	
DGF	30 (37.5%)
Graft survival (%)	78 (90.7%)
Transplantectomies	1 (1,3%)
High Cr at discharge (mg/dL)	2.73
Cr 3 months (mg/dL)	1.49
Cr 1 year (mg/dL)	1.44

DOI of original article:
https://doi.org/10.1016/j.nefro.2021.04.022.

Table 2 – Factors related to graft survival.

Donor			
	Survival (78)	Non-survival (8)	$p < 0.05$
Age	63.0 (55.3-68.0)	65.5 (61.0-71.8)	0.219
Men	59 (85.6%)	6 (75%)	1
Females	19 (24.4%)	2 (25%)	
Expanded criteria	47 (61.8%)	6 (75%)	0.704
Recipient			
Age	60.5 (51.8-66.3)	61.0 (55.3-67.0)	0.772
Men	59 (85.6%)	8 (100.0%)	0.191
Women	19 (24.4%)	0	
Diabetes mellitus	26 (33.3%)	6 (75.0%)	0.048
BMI	26.7 ± 4.5	30.8 ± 3.5	0.015
PD	21 (26.9%)	3 (37.5%)	0.68
Hemodialysis	45 (57.7%)	5 (62.5%)	1
Anticipated	12 (15.4%)	0	1
Previous Transplant	11 (14.1%)	1 (12.5%)	1
Ischemia times (median, IQR, minutes)			
LET - CRA	15.0 (11.0-18.0)	16.0 (12.3-16.8)	0.618
Functional HIT	19.0 (14.0-24.0)	20.5 (19.0-21.8)	0.431
CRA - perfusion	9.0 (7.0-10.0)	10.0 (9.0-12.0)	0.307
CIT	540.0 (360.0-1125.0)	452.5 (397.5-1045.0)	452.5 (397.5-1045.0)

could have masked any negative impacts of CIT. Our CIT is explained by the analysis of the KTs that have only been performed in this center, without taking into account kidneys referred to other centers, which would have prolonged the CIT.

Finally, other ischemia times such as the agonal phase and the time from cardiorespiratory arrest (CRA) to perfusion were not related to graft loss (Table 2). The only previously published study on the impact of the agonal phase on AD KT demonstrated no relationship between this time and graft survival.[10] On the other hand, the impact of time from CRA to perfusion on graft survival had not been previously analyzed.

Regarding delayed graft function (DGF), the present study found a lower rate than other published data[1,2] and that it was not related to graft loss, as were other recently published results.[2]

AD has evolved in recent decades, with increased use of ECD to meet the increasing demands of RT. Our results reveal that the use of these donors does not result in graft loss. Graft loss was determined by the recipient's diabetes mellitus and BMI, but not by ischemia times or donor or recipient age, as in some previously published studies.

Funding

This research has not received specific support from public sector agencies, the commercial sector or non-profit entities.

Conflict of interests

All authors declare no conflicts of interest.

Acknowledgements

The authors would like to thank Ana Rosa Millán for her help in the statistical analysis.

REFERENCES

1. Summers DM, Johnson RJ, Allen J, Fuggle SV, Collett D, Watson CJ, et al. Analysis of factors that affect outcome after transplantation of kidneys donated after cardiac death in the UK: a cohort study. Lancet. 2010;376:1303–11, http://dx.doi.org/10.1016/S0140-6736(10)60827-6.
2. Summers DM, Johnson RJ, Hudson A, Collett D, Watson CJ, Bradley JA. Effect of donor age and cold storage time on outcome in recipients of kidneys donated after circulatory death in the UK: a cohort study. Lancet. 2013;381:727–34, http://dx.doi.org/10.1016/S0140-6736(12)61685-7.
3. Pérez-Sáez MJ, Lafuente Covarrubias O, Hernández D, Moreso F, Melilli E, Juega J, et al. Early outcomes of kidney transplantation from elderly donors after circulatory death (GEODAS study). BMC Nephrology. 2019;20:233, http://dx.doi.org/10.1186/s12882-019-1412-0.
4. Locke JE, Segev DL, Warren DS, Dominici F, Simpkins CE, Montgomery RA. Outcomes of kidneys from donors after cardiac death: implications for allocation and preservation. Am J Transplant. 2007;7:1797, http://dx.doi.org/10.1111/j.1600-6143.2007.01852.x.
5. Singh SK, Kim SJ. Does Expanded Criteria Donor Status Modify the Outcomes of Kidney Transplantation From Donors After Cardiac Death? Am J Transplant. 2013;13:329–36, http://dx.doi.org/10.1111/j.1600-6143.2012.04311.x.
6. Mirshekar-Syahkal B, Summers D, Bradbury LL, Aly M, Bardsley V, Berry M, et al. Local expansion of donation after circulatory death kidney transplant activity improves waitlisted outcomes and addresses inequities of access to transplantation. Am J Transplant. 2017;17:390–400, http://dx.doi.org/10.1111/ajt.13968.
7. Singh SK, Kim SJ. Epidemiology of kidney discard from expanded criteria donors undergoing donation after

circulatory death. Clin J Am Soc Nephrol. 2016;11:317–23, http://dx.doi.org/10.2215/CJN.07190715.
8. Summers DM, Watson CJE, Pettigrew GJ, Johnson RJ, Collett D, Neuberger JM, et al. Kidney donation after circulatory death (DCD): state of the art. Kidney Int. 2015;88:241–9, http://dx.doi.org/10.1038/ki.2015.88.
9. Suntharalingam C, Sharples L, Dudley C, Bradley JA, Watson CJE. Time to cardiac death after withdrawal of life-sustaining treatment in potential organ donors. Am J Transplant. 2009;9:2157–65, http://dx.doi.org/10.1111/j.1600-6143.2009.02758.x.
10. Peters-Sengers, Houtzager JHE, Heemskerk MBA, Idu MM, Minnee RC, Klaasen RW, et al. DCD donor hemodynamics as predictor of outcome after kidney transplantation. Am J Transplant. 2018;18:1966–76, http://dx.doi.org/10.1111/ajt.14676.

Iris Coello*, Ana Isabel Martínez, Maria Peraire, Laura Aizpiri, Camila Andrea Vega, Miquel Amer, Ricardo José Guldris, José L. Bauzà Quetglas, Enrique Carmelo Pieras

Servicio de Urología, Hospital Universitario Son Espases, Palma de Mallorca, Spain

* *Corresponding author.*
E-mail address: iris.coello@ssib.es (I. Coello).

https://doi.org/10.1016/j.nefroe.2021.04.019

Efficacy and safety of semaglutide in a diabetic and obese patient on incremental hemodialysis. Does it also contribute to preserving residual renal function?

Eficacia y seguridad de la semaglutide en un paciente diabético y obeso en hemodiálisis incremental. ¿Contribuye también a preservar la función renal residual?

Dear Editor,

Diabetic kidney disease is the most common cause of advanced chronic kidney disease.[1,2] However, the therapeutic options continue to be limited for patients with diabetic kidney disease on maintenance haemodialysis. GLP-1 receptor agonists (GLP-1 RA) contribute to improving blood glucose control by reducing glycated haemoglobin (HbA1c).[3] Other beneficial effects include feeling full, weight loss, increased natriuresis, lower blood pressure, decreased albuminuria and slowing down the progression of diabetic kidney disease.[4,5] Despite this, its use in haemodialysis is rare.

We present the case of a 56-year-old man with high blood pressure, chronic obstructive pulmonary disease, advanced chronic kidney disease on pre-dialysis, type 2 diabetes mellitus treated with 32 IU of insulin detemir, 3 mg repaglinide and 5 mg linagliptin a day, with HbA1c at 8.5% and BMI 36.5 kg/m^2. In January 2021, he started incremental haemodialysis with one session/week (240 min) with an asymmetric cellulose triacetate dialyser (1.9 m^2) (ATA®) due to uraemic symptoms, poor blood pressure control and moderate-severe hyperkalaemia. His serum creatinine was 6.97 mg/dl (estimated glomerular filtration rate using the CKD-EPI formula, 8.48 ml/min/1.73 m^2), creatinine clearance (CrCl) and urea clearance (KrU) measured by 24-h urine 16 and 5.84 ml/min/1.73 m^2, respectively. His glomerular filtration rate measured by the half-sum of CrCl and KrU was 10.92 ml/min/1.73 m^2 and the albumin/creatinine ratio was 3200 mg/g.

In order to optimise the patient's blood-glucose control, semaglutide (0.25 mg/week) was added to the treatment, and linagliptin and repaglinide were discontinued. The doses were gradually increased to 1 mg over 12 weeks, with good tolerance and no episodes of hypoglycaemia, and the insulin dose was gradually reduced. At 24 weeks, the patient's HbA1c had decreased by 23.5%, weight by 10.2% and BMI by 10.5%. In addition, not only did his fat mass and total body water decrease by 16.4% and 12.2% respectively, his lean mass increased by 14% (Table 1). His glomerular filtration rate remained unchanged throughout the observed period. However, the two parameters evolved differently, with KrU increasing and CrCl decreasing. Urinary creatinine excretion normalised to kilograms of weight increased, and urea remained stable. His blood pressure and albumin/creatinine ratio also decreased (Table 1).

DOI of original article:
https://doi.org/10.1016/j.nefro.2021.07.014.