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Donor conditions and graft survival – a retrospective study

P. Wienand[1], T. Schröder[1], D. Stippel[1], and C. Baldamus[2]

[1] Department of Surgery, University of Cologne, Cologne, FRG
[2] Department of Internal Medicine, University of Cologne, Cologne, FRG

Abstract. In a retrospective study (one centre) the influence of donor and recipient factors were evaluated ($n = 308$). Head injury as the cause of death and anastomotic time less than 35 min were associated with a significantly better graft survival rate ($P < 0.05$). Although some of the donor factors influence graft survival, a stricter selection of grafts is not advisable, firstly because fewer kidneys would then be offered, and secondly because even comparatively bad graft survival rates are still better than dialysis.

Key words: Renal transplantation – Donor conditions – Graft survival

The analysis of ong-term results after cadaver kidney transplantation evokes the question as to the effects of donor factors. A retrospective study of donor-specific parameters proves their impact on recipient survival, graft survival and renal function 1 year after transplantation.

Materials and methods

From 1981 to 1990, 575 patients received a renal transplant. For 308 of them it was their first graft. The following donor factors were studied: age, cause of death, serum creatinine, diuresis during the last hour before explantation, technique of explantation, multiple organ donor, donor kidney side, renal artery with/without patch, warm ischaemia time, cold ischaemia time, anastomotic time and mode of sharing. Recipient survival and graft survival were calculated by cumulative survival rates by means of the Kaplan–Meier method. Graft function, according to the serum creatinine value 1 year after transplantation, was assessed either by analysing the linear regression, or by defining three different groups of function (good function with serum creatinine below 1.5 mg%, moderate function with serum creatinine between 1.5 and 4 mg%; bad function with serum creatinine higher 4 mg% but without dialysis) and evaluation by cross-tabulation and the chi-squared test.

Results

The 1-year survival rates were 96% for the recipients and 82% for the grafts. Cumulative survival rates after 5 years were 87% for the recipients and 61% for the grafts. None of the investigated parameters had any influence on recipient survival rates, and some of them (technique of explantation, donor kidney side, cold ischaemia time) did not affect graft survival. Donor age between 16 and 55 years, systolic blood pressure lower 140 mm Hg, diuresis during last hour about 100 ml and warm ischaemia time up to 5 min resulted in better graft survival rates, though without statistical significance. Head injury was the cause of death in 175 (57%) donors, spontaneous intracranial bleeding in 84 (27.4%), and other causes in 48 (15.6%), such as intoxication, primary brain cancer or suicide. Significantly lower graft survival rates were found for grafts from donors whose deaths were caused by spontaneous intracranial bleeding ($P < 0.02$), as well as for recipients with anastomosing times longer than 35 min ($P < 0.01$). Reduced diuresis during the last hour before explantation correlated with bad graft function, according to higher serum creatinine 1 year after transplantation ($P < 0.02$). However, there was no correlation between recipients' serum creatinine and the donors' diuresis over the last 24 h.

Conclusion

Donor factors and patient survival: no effect

Offprint requests to: Peter Wienand, Priv. Doz. Dr. med., Department of Surgery, University of Cologne, Joseph-Stelzmann-Str. 9, 5000 Köln 41, FRG

Donor factors and kidney survival without effect:
- technique of explantation
- donor kidney side
- cold ischaemia time

Donor factors with effect but not significant:
- donor age between 16 and 55 years
- systolic blood pressure lower 140 mm Hg
- diuresis during last hour 100 ml
- warm ischaemia time up to 5 min

Donor factors with statistical significant effect:
- death caused by spontaneous intracranial bleeding ($P < 0.02$)
- recipients with anastomosing times longer than 35 min ($P < 0.001$)