A multiplicative-regression model to compare the risk factors associated with time to graft failure between a first and second renal transplant

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INTRODUCTION

The prognosis of second kidney transplant recipients (STR) compared to first kidney transplant recipients (FTR) has been frequently studied.

But no study has addressed the issue of comparing the risk factors associated with the time to graft failure between both groups.

The limits of classical survival models:

A comparison of risk factors between both groups is possible but would imply testing interactions of all the factors with the graft rank.

STR-specific covariates (survival time of the first transplant, time in dialysis before retransplantation or transplantectomy) cannot be analyzed, despite the knowledge that their use would improve risk evaluation.

OBJECTIVE

To evaluate difference in risk factors associated with time to graft failure between a specific group (STR) and a reference group (FTR).

MATERIALS AND METHODS

Patients were selected from the French DIVAT (www.divat.fr/en) multicentric prospective cohort.

Centers: Nantes, Necker, Nancy, Toulouse, Montpellier, Lyon
Adult recipients
Transplanted from 1996 to 2010
Under mycophenolate mofetil and steroids at transplantation

566 STR (group of interest) and 2206 FTR (reference group)

The main endpoint was the patient-and-graft survival, it means that the event of interest was the time between the date of transplantation and the date of graft failure, which was the first event between return to dialysis and patient death with a functioning graft.

RESULTS

Donor gender and waiting time before re-transplantation were not taken into account in the expected hazards (as they were not risk factors for FTR):

The risk of graft failure was 1.5-fold higher for STR with grafts from males compared to STR with grafts from females (p = 0.0320).

The risk of graft failure was 1.9-fold higher for STR with a long time before retransplantation compared to STR with a short waiting time (p < 0.0001).

Regarding the hazard ratios (HR) observed in the FTR (gray column), expected HRs associated with recipient and donor age would be respectively 1.39 and 1.34 in the STR. In fact, the relative model showed that both variables appeared to be differently associated with the risk of graft failure between STR and FTR:

The HR associated with recipient age ≥ 55 years was 1.6-fold higher for STR compared to FTR (p = 0.0480).

The HR associated with donor age ≥ 55 years was nearly 2-fold lower for STR compared to FTR (p = 0.0440).

CONCLUSION

The adverse effect of recipient age was enhanced for STR

A cumulative effect of the risk factors for STR (the cumulative exposure to immunosuppressive drugs)

Clinicians should pay a particular attention to recipient age in second graft

The adverse effect of older transplanters was attenuated for STR

An indication bias with only high-quality donors proposed to STR

A higher pre-graft NHLA immunization in STR, explaining why graft failure is due to immunological phenomena rather than transplant quality?

REFERENCES


[2] JD. Buckley. The adverse effect of recipient age was enhanced for STR.