

KSN 2016 Abstract Submission

Transplantation & Immunology

KSN2016ABS-1367

Elderly kidney transplant recipients need optimized immunosuppression according to comorbidity and infection
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Background: The numbers of elderly kidney transplantation (KTPL) is increasing, but there are limited studies about the use of immunosuppressant in this group. Elderly patients has more comorbidities and infection rates, so we should be aware of optimizing immunosuppressant in these patients. We investigated the usage, drug levels of immunosuppressant and the outcomes in the elderly compared with younger recipients.

Methods: Younger (≤ 60 yrs, n=2939) and elderly (> 60 yrs, n=177) KTPL recipients were recruited from 3 centers in Korea between 1997 and 2012. The information including age, sex, charlson's comorbidity index (CCI), prescribed immunosuppressant and drug level were obtained. The levels of immunosuppressant were compared according to the age group. Patient and graft survival, biopsy-proven acute rejection (BPAR), infection requiring hospitalization, and malignancy were analyzed according to the drug usage in the elderly.

Results: The elderly patients who underwent KTPL during 2007-2012 increased compared with younger patients (68.4% vs. 45.5%). CCI was higher in elderly group (2.6 ± 1.1 vs. 3.5 ± 1.4 , $p < 0.001$) and the rates of mortality, graft failure, BPAR and malignancy were higher ($p < 0.001$). Especially, infection were higher during early phase after KTPL in elderly patients ($p < 0.001$) than younger recipients. Trough levels of calcineurin inhibitors at 1 year after KTPL were lower in the elderly than younger group (7.2 ± 1.9 vs. 7.9 ± 1.9 ng/mL, $p = 0.001$ for tacrolimus [Tac]; 192.0 ± 121.2 vs. 239.1 ± 151.0 ng/mL, $p = 0.028$ for cyclosporine [CsA]). Higher CCI (≥ 5) groups tended to have lower trough level than those with lower CCI (2-4) (7.4 ± 1.8 vs. 7.9 ± 1.9 ng/mL for Tac [$p = 0.002$], 208.5 ± 142.6 vs. 238.8 ± 150.5 ng/mL for CsA [$p = 0.096$]) in elderly patients. When we divided elderly patients in 2 groups by mean drug levels (Tac = 7.6 ng/mL, CsA 206.5 ng/mL), infection events occurred significantly more in higher drug level groups in Tac groups ($p = 0.021$), but not in CsA groups. There were no significant differences of BPAR, graft failure, malignancy and mortality rates between higher and lower drug level groups.

Conclusion: The elderly used lower dose of immunosuppressant than the younger due to higher comorbidities, infection rate. Elderly patients with post-transplant infection and much comorbidity need earlier tapering of immunosuppression.

Keywords: elderly patient, Immunosuppressive therapy, Kidney Transplantation