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Long-term Outcomes of Stratified Desensitization Therapy based on Immunological Risk in Living Donor Kidney Transplantation

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Objectives : The application of desensitization therapy has enabled highly sensitized kidney transplant recipients (KTRs) to receive kidney transplantation (KT) which had not been possible in the past. We previously reported the impact of desensitization with rituximab (RTX) and plasmapheresis (PP) in KTRs based on crossmatch testing (XM), panel reactive antibody (PRA) and donor-specific anti-HLA antibody (HLA-DSA) levels. In this study, we investigated the long-term outcomes of desensitization in highly sensitized KT since Jan, 2010.

Methods : A total of 434 patients were treated with our desensitized protocol based on results of CM, PRA and HLA-DSA. The patients were divided into 3 groups depending on desensitized methods: RTX/PP/ intravenous immunoglobulin (IVIG) (the RPI group; n = 44), RTX monotherapy (the RTX group; n = 62), and the control group (the CON group; n = 326). Briefly, patients with positive XM or moderate to severe HLA-DSA levels were prepared to RTX/PP/IVIG. Patients with PRA levels over 50%, negative XM and negative to weak HLA-DSA were only administered RTX. Patients with negative XM, negative to weak HLA-DSA, and PRA levels under 50% did not receive pretreatment and were classified to CON group. Allograft biopsy was conducted in 298 subjects. We compared the development of acute rejection, rejection free survival, allograft function, allograft survival, patient survival and infectious complications in the three groups over 7 years.

Results : Overall allograft survival rate for 7 years was 94.9% (CON group, 96%; RIT group, 96.8%; RPI group, 84.8%). The incidence of biopsy-proven acute rejection (BPAR) in the RPI group was higher than in the CON and RTX groups

(p<0.01 for both). Rejection free survival and allograft survival was inferior in the RPI group compared to the other groups (p<0.001 for both). However, the renal function of functioning allograft was similar in all groups and patient survival was not different between the three groups. For infectious complications, the RPI group suffered to a higher incidence of infection than the CON and RTX groups (p<0.01 and p<0.05, respectively). In the Cox-regression analysis, BPAR was an independent risk factor for allograft survival (p<0.01), and patient survival was affected by age, presence of bacterial infection and history of BPAR (p<0.001, p<0.05 and p<0.01, respectively).

Conclusions : In the long-term follow-up, allograft survival and patient survival of the RPI group was inferior to the CON and RTX groups. Although desensitization provides an opportunity of KT in a high risk immunologic setting, both strict monitoring and sufficient prophylaxis are needed to improve BPAR, allograft survival and prevent infectious complications.

Keywords : Kidney transplantation, desensitization, graft rejection, infectious complication