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Individualized immunosuppression strategies according to alloimmune risk

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Current immunosuppression has markedly improved kidney allograft outcomes. However, its insufficient efficacy cannot prevent chronic rejection and long-term nonspecific immunosuppression leads to serious complications, such as infection and malignancy. Therefore, patient-tailored immunosuppression is needed to avoid too heavy and too weak immunosuppression. Personalized immunosuppression needs risk stratification for both rejection and complications.
Pretransplant alloimmune risk stratification is based on eplet mismatch for primary immune response and donor-specific antibody and T cell ELSIPOT for humoral and cellular memory response. Pretransplant alloimmune risk stratification also includes donor-related and recipient-related factors. Furthermore, complication risk stratification is also needed based on age, comorbidity as well as risk for infection and malignancy.
According to the alloimmune risk strata, we can determine initial immunosuppression, such as specific induction, target concentration of calcineurin inhibitors, dose of proliferation inhibitors, and desensitization. After initial immunosuppression, we had better monitor ongoing allograft damage using donor-specific antibody, protocol biopsy, or donor-derived circulating cell-free DNA and assess risk of rejection or over-immunosuppression using intraindividual variability and BKV titer. Based on this follow-up monitoring, we can adjust immunosuppression to personalized regimens tailored to the current status of kidney transplant patients. Personalized immunosuppression based on alloimmune stratification and ongoing monitoring could improve efficacy and safety of immunosuppression in kidney transplantation.