

Transplant Immunology I

The mTOR inhibitor in kidney transplantation

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Since calcineurin inhibitor (CNI) was introduced into clinical practice in the 1980s, CNI has been used as a representative maintenance immunosuppressant in organ transplantation more than three decades. However, we also experienced CNI-related side effects such as BKV nephropathy, cancer, nephrotoxicity and cardiovascular risk factors. Therefore, need for immunosuppressive agents that can minimize or replace CNI is emerging. Today, I would like to present mTOR inhibitor.

The mTOR inhibitors are attractive agents in terms of anticancer effect, immunomodulatory effect and BKV suppression. However, when mTOR inhibitor is administered together with CNI, synergistic toxicity is a problem because the drug interaction of CNI and mTOR inhibitor increases concentration of each drug in the target organ as well as the peripheral blood. Therefore, it is desirable to lower the CNI dose when using two drugs together.

To support this, recent clinical trials of combined administration of low CNI and everolimus showed comparable clinical results with the standard dose of CNI and mycophenolate mofetil. In conclusion, low CNI plus mTOR inhibitor may be alternative to standard CNI and mycophenolate mofetil in kidney transplantation.