Usefulness of pre- and post-transplant BK virus-specific ELISPOT assay for predicting the outcome of BK virus infection in kidney transplant recipients

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Background: To investigate if BK virus (BKV)-specific T cell immunity measured by an interferon- γ enzyme-linked immunospot (ELISPOT) assay at pre- and post-transplant can predict the outcome of BKV infection in kidney transplant recipients (KTRs).

Methods: We included 60 KTRs with BK viremia and checked BKV ELISPOT assay at pre- and post-transplant 1 month, 3 months, and the time of BKV viremia detected. All participants were divided into persistent-viremia group (>3 months) and cleared-viremia group (<3 months) according to sustained duration of BKV infection. We compared pre- and post-transplant BKV-ELISPOT results against five BKV peptide mixes (LT, St, VP1-3), and fluorescence-activated cell sorting (FACS) of immune cell results.

Results: The pre-transplant BKV-ELISPOT results were lower in persistent-viremia group than those of cleared-viremia group ($P=0.054$). Also, they tends to be lower in BKV-associated nephropathy (BKVN) group compared to those of No-BKVN group ($P=0.133$). At the time of the first BK viremia detected, BKVN group had tendency of lower St, VP1-ELISPOT results compared to No-BKVN group ($P=0.075$, $P=0.071$, respectively). In FACS analysis at the time of viremia, persistent-viremia group showed higher portion of CD8+ T cell, and CD3+CD4+CD57+CD28nullCD161+ cell compared to cleared-viremia group ($P=0.014$, $P=0.019$, respectively).

Conclusions: Pre- and post-transplant BKV-ELISPOT assay may be effective in predicting clinical outcomes of BKV infection in terms of clearance of BKV and development of BKVN.

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