ABSTRACT

Polyoma BK virus is associated with graft dysfunction leading to BK viral nephropathy (BKVN) in 1-10% of kidney transplant recipients, moreover 30-80% of kidney transplant recipients experience asymptomatic reactivation of the virus that does not result in BKV associated damage of the renal allograft.

The first aim of this study was to introduce monitoring of BK virus replication in the blood and urine of patients within first year after transplantation.

Risk factors were evaluated and limit values for viremia and viruria for BKVN development was established. Positive BK viruria $>10^7$ copies/ml and positive BK viremia $>10^4$ copies/ml occurred in 25.8% and 5%; respectively. 3 patients out of monitoring study developed BKVN. Using ROC analysis, limit values for the development of BKVN were set at 10^3 copies/ml serum for BK viremia and $6.7x10^7$ copies/ml BK viruria.

The second objective was to determine the expression profile of the immune genes in kidney biopsies in three groups of patients with varying degrees of reactivation of the BK virus (without virus reactivation, with asymptomatic viruria, BKVN). 90 genes of immune response were measured by the TaqMan® low density array RT-qPCR.

The analysis of biopsies from patients with non-signalling viruses led to the identification of 5 differentially expressed genes (CD3E, CD68, CCR2, ICAM-1, SKI, $p<0.05$), and functional analysis showed a significantly increased presence of costimulatory signals (CD40/CD40L; 0.05).

Compared with the control group, the BKVN group showed a different expression of 33 of the 90 genes measured. Functional analysis showed that patients with BKVN had significantly higher expression levels of apoptotic genes (FasL/FAS, $p<0.05$) and signal molecules (CD28, CD80, CD86, $p<0.05$).

Key words: BK virus, BKVN, kidney transplantation, gene expression