신 이식 환자에서 BK바이러스 신증 예방을 위한 BK 바이러스 혈증의 감시의 임상적 효용성

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정병하, 홍유아, 김현경, 최선령, 선인오, 박훈석, 최범순, 박철휘, 김용수, 양철우

Clinical Usefulness of BK Viremia Monitoring to Prevent the Development of BK Virus Associated Nephropathy in Renal Transplant Recipient

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Background: BKV replication plays the causative role in the development of BKV-associated nephropathy (BKVN). Because of the lack of effective therapy, early diagnosis of BKV reactivation is the basis for the prevention of BKVN. The present study analyzed clinical usefulness of BK viremia monitoring to prevent the development of BKVN.

Methods: First, we investigated the predictive value of plasma BKV real time PCR for the diagnosis of BKVN by retrospective review of the result of indication biopsies. Based on the results, cut-off value for presumptive BKVN was defined. Second, we prospectively check the plasma BKV real time PCR at 3, 6, 9, 12 months after kidney transplantation (KT) in 145 patients who took kidney transplantation between 2008.10 and 2010.6. When BKV replication was detected over the defined cut-off value, we reduced immunosuppression (IS). We analyzed the effectiveness and safety of the regular monitoring of BKV replication and preemptive IS reduction.

Results: From 2004 and 2010, the prevalence of BKV nephropathy was 3.2% of indication biopsy cases (6/189). The sensitivity and negative predictive value for BKV nephropathy by decoy cell, urine and plasma BKV real time PCR was 100% respectively. However, specificity and positive predictive value were highest in plasma BKV real time PCR and the cut-off value for BKVN was 4×10^4 copies/mL. In the prospective monitoring of BKV real time PCR, BK viremia developed in 8.3% within 1 year after transplantation (12/145) and the median interval from KT to the development of viremia was 163 days (29-685). After reduction of immune suppressant, viremia was cleared in 91.6% (11/12) and it took 103 days (25-254). BKVN developed in only one patient, who was highly sensitized and took ABO incompatible KT. She took anti-thymocyte globulin, plasma exchange and high dose intravenous immunoglobulin as a preparation before KT. In comparison between patients with viremia and without viremia, allograft function and the frequency of acute rejection did not differ significantly at 6 months and 1 year after KT ($p>0.05$, respectively).

Conclusion: Preemptive reduction of immunosuppression in patients with BKV viremia is useful to prevent the development of BKVN and it did not increase the risk of acute rejection.

Key Words: BK바이러스 혈증, 중합효소 연쇄반응, BK 바이러스 신증
BK viremia, Real time PCR, BK virus nephropathy