BK Viremia in Patients with Chronic Renal Disease Undergoing Hemodialysis and Peritoneal Dialysis

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Objective:

BK virus (BKV) belongs to genus polyomavirus within the polyomaviridae, a family of unenveloped DNA viruses and was described with high prevalence, low morbidity, latency, and rare clinical manifestation.

BKV infects up to 90% of the general population with little clinical significance and with various epidemiologic patterns of infection. The primary infection with BKV usually occurs during early childhood and then virus persists in the renal tissue. Studies revealed that approximately 80% of adults become seropositive for BKV.

The primary infection is often asymptomatic but reactivation may be stimulated by immunosuppression associated with kidney and bone marrow transplantation, human immunodeficiency virus infection and other factors, such as old age, pregnancy, and diabetes mellitus.

Immune suppression is considered the main risk factor for BKV reactivation. Due to impaired immunity in both cellular and humoral immunity in patients undergoing hemodialysis (HD) or peritoneal dialysis (PD), they are at high-risk for infectious diseases such as BKV infection. This study aimed to determine the BK viremia in Iranian patients with chronic renal disease undergoing hemodialysis and peritoneal dialysis.

Methods:

In this cross-sectional study, 63 HD and 33 PD patients were enrolled from main dialysis units of Tehran, Iran, from September 2013 to November 2013. Sixty-three and 33 of them were under hemodialysis and peritoneal dialysis respectively.

Blood samples were collected before dialysis, and plasma were stored at -80ºC. BK viremia was determined by qualitative PCR in all subjects.

The Chi-square and fisher exact test were used with the SPSS 16 Package program for statistical analysis.

Results:

Sixty-three cases under HD with mean age 59.3±14.5 years and 33 subjects on PD with mean age 53.7±13 years were enrolled in the study.

In HD group, the mean duration of hemodialysis was 59.1±53.8 months and dialysis interval was 3 times a week. 65.1% of cases were female and 34.9% were male.

In PD group, duration of dialysis was 38.9±35.2 months. 45.5% of subjects were female and 54.5% were male.

The prevalence of BK viremia was 3.03% (1 of 33) in PD and 0% (0 of 63) in HD subjects. BKV infection was observed in a 31 years old man who was under peritoneal dialysis for 2.5 years.

There was no significant difference between PD and HD group regarding BK viremia (p=0.34).

Conclusions:

This study showed low rate of BKV in our chronic renal disease patients.

BKV replication was limited to one patient of the PD group, and HD group did not show BKV infection. BKV replication in the PD cases was 3.03% versus 0% in the HD subjects. Although, other published reports have shown different rate of BK virus replication among patients from different countries, the low/absent BKV replication detected in this paper could be in agreement with low incidence of BKV infection in the Iranian renal transplant recipient.

Since BKV is closely linked to graft rejection in kidney transplants, and the number of cases tested in this study was low, further studies with larger populations of dialysis patients and healthy control group are needed to draw solid and convincing conclusion regarding BKV replication in these patients.