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ORIGINAL ARTICLE

A Single Center's Experience with BK-Virus Frequency in Post-Renal Transplant Patients in IKD Peshawar

RAZA MUHAMMAD KHAN[1], NAJAM UD DIN MUFTI[2], WAQAS SARDAR[3], ABDUL HASEEB[4], SAAD HANAN[5], AHMAD ZEB KHAN[6]
[1]*Senior Registrar Medical unit Mercy Teaching Hospital Peshawar*
[2]*Assistant Professor Nephrology Unit Mercy Teaching Hospital Peshawar*
[3]*Medical Officer Nephrology Unit Institute of kidney Diseases HMC Hayatabad Peshawar*
[4]*Medical Officer Nephrology Unit Institute of kidney Diseases HMC Hayatabad Peshawar*
[5]*Medical Officer Nephrology Unit Institute of kidney Diseases HMC Hayatabad Peshawar*
[6]*Associate Professor Nephrology Khyber Teaching Hospital Peshawar*
Corresponding author: Ahmad Zeb khan, Email: ahmad.zeb@hotmail.com

ABSTRACT

Objective: To measure the incidence of BK-Virus infection, treatment, and complications among patients who had kidney transplants at the Institute of Kidney Diseases (IKD) in Peshawar, Pakistan.

Methodology: The single center experience retrospective study was conducted in IKD Peshawar, Pakistan from January to December 2021. Clinical and analytical data was gathered. Blood samples were tested for BK virus load using quantitative DNA-polymerase chain reaction (PCR).

Results: A total of 131 patients were examined. Of the 131 participants, 117 (89.4%) were males and 14 (10.6%) were females, with a mean age of 30.04 5.41. All of the patients received a transplant from a blood relative. After six months, the BK-Virus plasma PCR was found to be positive in eight patients (6.2%) who had had kidney transplantation.

Conclusion: Patients who have had a kidney transplant and are on induction treatment or other forms of immune-suppression are at an increased risk of contracting the BK-Virus infection. Immunosuppressive medicines should be reduced to the barest minimum for effective treatment.

Keywords: Transplanted Kidneys, BK Virus.

INTRODUCTION

In the Polyomaviridae family, BKV (Polyomavirus BK) has been found in populations across the globe [1]. As a rule, the disease is asymptomatic until it has spread to other organs. It's possible that the BK virus will stay dormant after an asymptomatic infection in several bodily parts, including the renal tubular epithelium[2]. Reactivation of the virus and graft malfunction occur when the immune response is reduced, as in renal transplant patients who have had therapeutic immunosuppression [3]. An major side effect of renal BKV reactivates after transplantation, causing nephropathy (BKVN). 30% of renal transplant patients had BKV viruria, viremia, and BKVN , which may lead to graft loss in 50% of instances if left untreated [4]. Variations in reported incidence may be due to the immunosuppression used during induction, maintenance, and screening. BKVN affects 5.7% to 7.5% of US kidney allografts [5]. HLA mismatches, donor ages, deceased donors, and male gender are rejection risks . Anti-rejection treatment using anti-thymocyte globulin or IVIG is a risk factor. Modern procedures recommend post-transplant monitoring and treatment of infections to avoid graft-threatening BKV nephropathy[6].

Rapidly rising blood creatinine levels may indicate BKV-linked kidney disease. The most often used BK virus testing method is the quantitative real-time polymerase chain reaction (PCR)., however standard cut-off values have not been created. Urinary BK virus load of 10 ml or plasma BK virus load of 10 [4] copies may indicate Nephropathy caused by the BK virus. Allograft biopsy is the sole way to detect BK virus-associated nephropathy [7]. Antiviral medicines are unable to stop BKV replication at this time. MMF and/or calcineurin inhibitors are considered to reduce the reproduction of BKV [8]. This raises the possibility of transplant rejection. Despite worldwide investigation, our exact whereabouts remains a mystery. Patients who have had a kidney transplant will be examined to see whether they are at increased risk of contracting BK Virus infection, how to treat it, and how well they recover[9].

MATERIALS AND METHOD

The Institute of Kidney Diseases Peshawar did A single center study The medical records of all patients who had a kidney transplant at the IKD Peshawar, between January from December 2021., were evaluated. The medical records of the patients were used to compile demographic, clinical, and laboratory data, including age, gender, donor type, immunosuppressive regimen, BK virus PCR, therapy provided, and treatment outcomes. According to their reported cytomegalovirus (CMV) status, all kidney transplant patients had received antiviral prophylaxis; nonetheless, all transplant recipients underwent induction with interleukin-2 receptor antagonists (Basiliximab). In accordance with regular surgical procedure, Ureteric Stents were inserted. Anti-proliferative agents (either mycophenolate mofitel or Azathioprine) and oral prednisolone (Tacrolimus or Cyclosporine) were selected for the triple immunosuppressive regimen.

RESULTS

A total of 131 patients were examined. Of the 131 participants, 117 (89.4%) were men and 14 (10.6%) were women, with an average age of 30.04 5.42. All of the patients received a live-related transplantation. After nine months of follow-up, BK-Virus PCR was positive in Eight patients (6.2%) who had had kidney transplantation. Immunosuppression was reduced to the bare minimum for all patients, with good results. The diagnosis of BK virus-related nephropathy was confirmed in four more patients who underwent graft biopsy. Stable renal function and absence of problems were the only criteria for release for all of the patients. Table-1 and Fig-2 re shown in Fig-1.

Table 1: statistics that are descriptive total number of patients, mean and standard deviation

Descriptive Statistics			
	Number (n)	Mean	Std. Deviation
Age in years	131	30.045	5.4062

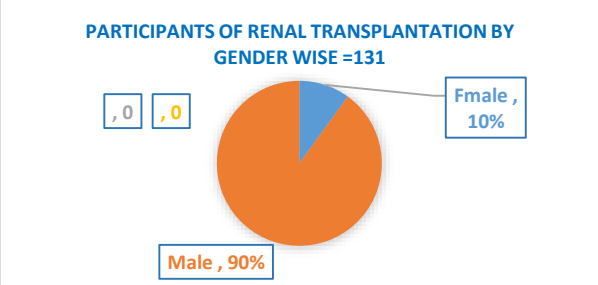

Figure 1: Renal Transplantation Gender Wise=N-131

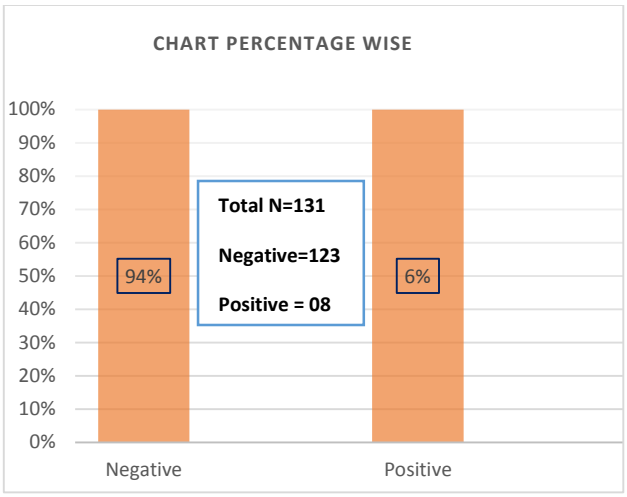

Figure 2: After a Renal Transplant, BK-Virus PCR in Patients

DISCUSSION

Immunosuppressive medication has decreased acute rejection in kidney transplant recipients, but it's also linked to viral infections. BK-virus (BKV)-related infection and graft dysfunction are Following kidney transplantation, nephropathy is more common [10]. In order to identify BK virus early, real-time BK-Virus PCR in plasma is utilised. BK Virus Nephropathy may be detected via plasma real-time PCR testing. For BK Nephropathy, the test has a near 100% specificity and 94% specificity, which means it can diagnose the illness with near 100% sensitivity. This screening procedure is used by our transplant centre. In individuals with nephropathy, a BK virus load of more than 4 log copies/mL was highly related with BKVN on biopsy [11]. BK-Virus PCR found positive in 6% of our patients six months after transplant. According to another research, 10% of Pakistanis were infected with the BK virus. In-depth research has been done on the prevalence of BK virus nephropathy. 7% and 10 percent were the results of two investigations conducted in North India. BK virus infections were quite infrequent in Iran [12]. The BK virus was found in 0.77 percent of transplant samples in one research [13]. Sixty-nine percent of kidney transplant biopsies from Japan are positive for BKV. The following percentages apply: Studies conducted in the United Kingdom indicate that it is an extremely unusual occurrence. There are a plethora of transplantation centres to choose from. Comparable findings have been obtained from prior investigations. BK virus nephropathy in Pakistani renal allograft patients needs additional research[14]. Patients with kidney transplants who are receiving significant doses of immunosuppression have a higher risk of contracting the BK virus. After kidney donation, it's important to be screened for BKV infection as after. Use of immunosuppressive medicines should be kept to a minimum if at all possible[15].

CONCLUSION

Patients who have had a kidney transplant and are on high doses of immunosuppression are at a higher risk of contracting the BK-Virus infection. Renal transplant patients should have their BKV infection carefully watched in the first few months after their transplant. By decreasing the immunosuppressive medicines to a minimum level, treatment is effective.

REFERENCES

1. Jamboti, J. S. (2016). BK virus nephropathy in renal transplant recipients. Nephrology, 21(8), 647-654.
2. Raupp, F. V. V., Meinerz, G., da Silva, C. K., Bianco, P. C. D. A., Goldani, J. C., Pegas, K. L., ... & Keitel, E. (2020). BK Polyomavirus-associated nephropathy managed by screening policy in a real-life setting. Transplant Infectious Disease, 22(1), e13213.
3. Martinez, M. AI., Guimera, G. J., Riera, M.V., Pieras, A. E.(2020). Prevalence of BK Virus in Renal Transplant at a Single Center: Experience With Our Ureteral Reimplantation Surgical Technique. Exp Clin Transplant, 18(4),458-62.
4. van Doesum, W. B., Gard, L., Bemelman, F. J., de Fijter, J. W., Homan van der Heide, J. J., Niesters, H. G., ... & Sanders, J. S. F. (2017). Incidence and outcome of BK polyomavirus infection in a multicenter randomized controlled trial with renal transplant patients receiving cyclosporine-, mycophenolate sodium-, or everolimus-based low- dose immunosuppressive therapy. Transplant Infectious Disease, 19(3), e12687.
5. Yi, S. G., Knight, R. J., & Lunsford, K. E. (2017). BK virus as a mediator of graft dysfunction following kidney transplantation. Current Opinion in Organ Transplantation, 22(4), 320-327.
6. Premathilake, M. I., Jayamaha, J. S., & Lanerolle, R. D. (2018). Prevalence of BK virus among renal transplant recipients in a tertiary care hospital in SriLanka. Ceylon Medical Journal, 63(3).
7 Lee, S., Lee, K. W., Kim, S. J., & Park, J. B. (2020, July). Clinical characteristic and outcomes of BK virus infection in kidney transplant recipients managed using a systematic surveillance and treatment strategy. In Transplantation proceedings (Vol. 52, No. 6, pp. 1749-1756).
8 Elsevier.Sawinski, D., & Goral, S. (2015). BK virus infection: an update on diagnosis and treatment. Nephrology DialysisTransplantation, 30(2), 209-217.
9. Atif, G. (2020). Prevalence of CMV and BK virus infections in kidney and liver post- transplant patients, Virology, July 20-21, Montreal, Canada.
10. Agrawal, V., Gupta, R. K., Jain, M., Prasad, N., & Sharma, R. K. (2010). Polyomavirus nephropathy and cytomegalovirus nephritis in renal allograft recipients. Indian Journal of Pathology and Microbiology, 53(4), 672.
11. Sachdeva, M. U., Nada, R., Jha, V., & Joshi, K. (2004). Viral infections of renal allografts--an immunohistochemical and ultrastructural study. Indian journal of pathology & microbiology, 47(2), 189-194.
12. Ghafari, A., Lessan-Pezeshki, M., Taghizadieh, M., & Rahimi, E. (2008, January). BK polyoma virus nephropathy among Iranian renal transplant recipients. In Transplantation proceedings (Vol. 40, No. 1, pp. 193-195). Elsevier.
13. Soleymanian, T., Rasulzadegan, M. H., Sotoodeh, M., Ganji, M. R., Naderi, G., Amin, M., & Najafi,
(2010). Low prevalence of BK virus nephropathyon nonprotocol renal biopsies in Iranian kidney transplant recipients: one center's experience and review of the literature. Experimental and clinical transplantation: official journal of the Middle East Society for Organ Transplantation, 8(4), 297-302.
14. Namba, Y., Moriyama, T., Kyo, M., Imamura, R., Shi, Y., Ichimaru, N., & Okuyama, A. (2005). Prevalence, characteristics, and outcome of BK virus nephropathy in Japanese renal transplant patients: analysis in protocol and episode biopsies. Clinical transplantation, 19(1), 97-101.
15. White, L. H., Casian, A., Hilton, R., MacPhee, I. A., Marsh, J., Sweny, P., & Warrens, A. N. (2008). BK virus nephropathy in renal transplant patients inLondon. Transplantation, 85(7), 1008-1015