UCDAVIS HEALTH | CHILDREN'S HOSPITAL

GUIDELINE FOR BK VIRUS SCREENING AND TREATMENT POST-TX

I. PURPOSE - To outline the evaluation and management of BK viremia post kidney transplant.

II. SETTING - Inpatient and Outpatient

III. DEFINITIONS

BK polyoma virus is the main cause of polyomavirus-associated nephropathy (BKVAN or PyVAN) after kidney transplantation and PyV-associated hemorrhagic cystitis in stem cell transplant (HCT). Both PyVAN and PyVHCT) are rarely seen in non-kidney SOT. In addition, isolated cases of encephalitis, pneumonitis, retinitis, colitis, hemophagocytic syndrome and urothelial cancer have been described. BKV disease occurs almost exclusively in immunocompromised hosts but requires additional factors specific to patient and clinical setting to unfold its pathogenic impact.

Renal graft dysfunction and failure is the biggest risk of BK Viremia. Early identification and intervention reduces the risk of graft failure. Risk factors include donor factors such as recent viral exposure, female gender, HLA mismatches; recipient factors such as younger age, male gender, highly sensitized status; other factors such as ureteric stents, ATN, acute rejection treatment, steroids, lymphocyte depleting agents, re-transplant after graft loss due to PyVAN.

IV. POLICY

1. SCREENING AND DIAGNOSIS:

a. Urine BK PCR: Urine BK PCR is not recommended as a screening test; not specific for disease

b. Plasma BK PCR: recommended method for screening. Inter assay-variability exists, serial monitoring should be done using the same lab. Diagnostic titer > 1,000 copies/mL in 2 measurements within 3 weeks.

c. Screen monthly x 9 months, then quarterly x 2 yr post-tx; then annually x 5 yr post-tx

d. Screen whenever there is graft dysfunction, biopsy performed or after rejection treatment

e. Urine cytology: the presence of "decoy cells" are markers of BK replication, not necessarily indicating nephropathy

f. Renal biopsy: Gold standard for dx of BKN; Histology, + immunohistochemistry tests. Obtain if there is evidence of renal dysfunction; or if pts have increased risk of rejection with reduced IS, such as being highly sensitized, have DSA, or re-transplanted pts. Biopsy is not required if there are no risk factors for rejection and renal fx is at baseline.

g. Scoring: Banff score for BKN

h. If BK viral load above threshold detected with no renal dysfunction, confirm with repeat within 3 weeks; if increasing, proceed with reducing IS as described below.

2. TREATMENT:

a. Reduce dose of anti-metabolite by 25-50%; continue same doses of CNI and prednisone (if on prednisone)

b. Monitor viral load every 2 weeks using the same laboratory

c. Monitor renal fx and Allosure closely
d. If high viral load same or increased after 2 weeks, stop anti-metabolite
e. If viral load same or increased after 4 weeks, reduce CNI dose to target lower levels (4-6 for tac and 50-100 for CsA)
f. Other options include IVIG, Cipro or Levaquin, Cidofovir or Leflunomide – consult ID
g. Other IS options:
Switch from MPA to mTOR inhibitor
Switch from MPA to leflunomide

3. RE-TRANSPLANTATION
a. Patients with graft loss due to BKN should be considered for re-transplantation
b. Native or graft nephrectomy is not recommended
c. Confirmation of viral clearance should be made prior to transplantation by plasma BK virus PCR

V. RESPONSIBILITY
Arundhati Kale, MD

VI. REVIEWED BY
Arundhati Kale, MD
Lavjay Butani, MD
Stephanie Nguyen, MD
Maha Haddad, MD
Gia Oh, MD
Machi Kaneko, MD

VII. REVIEWED DATE and REVIEW CYCLE: June 21, 2024

VIII. REFERENCES:
a. BK Virus Nephropathy in Kidney Transplantation: A State-of-the-Art Review Sam Kant 1,2,* , Alana Dasgupta 3 , Serena Bagnasco 3 and Daniel C. Brennan 1,2; Viruses 2022, 14, 1616. https://doi.org/10.3390/v14081616
b. BK polyomavirus in solid organ transplantation—Guidelines from the American Society of Transplantation Infectious Diseases Community of Practice; Hans H. Hirsch | Parmjeet S. Randhawa | on behalf of AST Infectious Diseases Community of Practice.
Clinical Transplantation. 2019;33:e13528.

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