In the name of God

Protocol of

Parvovirus B19 infection

in immunocompromised hosts

Protocol developed by:

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1-Introduction:

Parvovirus B19 (PVB19) is a single-stranded DNA virus that infects the majority of humans. Seroepidemiologic studies demonstrate that 60%–90% of adults have antibodies against PVB19.

Transmission of PVB19 infection occurs either by the respiratory route, vertically from mother to fetus, through transfusion, blood derivatives or transplantation. In immunocompetent patients, PVB19 infection is characterized by fever, chills and myalgia, followed by rash and joint symptom.

In transplant patients, *parvovirus B19* infection is transmitted through the donor's organ or contaminated blood products during transfusion. Increased susceptibility due to immunosuppressive therapy is likely to favor establishment of infection. The median time to onset of PVB19 disease is 1.75 months (range, 1 week–96 months) after transplantation. In 65% of patients, the onset is within 3 months following transplantation.

Anemia, leukopenia, and thrombocytopenia are present in 98.8%, 37.5%, and 21.0% of the patients, respectively. Hepatitis, myocarditis, and pneumonitis have also been reported in association with PVB19 disease. Allograft tissue loss or dysfunction is observed at the time of PVB19 disease in 10% of cases.

Diagnosis is based on the detection of B19 IgG and IgM antibodies or B19 DNA in blood or tissue samples by polymerase chain reaction (PCR). Since immunocompromised patients are unable to mount humoral or cellular responses, PVB19 IgM or IgG is detected only in 79% of them.

2- Indications for investigation:

- Anemia
- Leukopenia
- Thrombocytopenia
- Unexplained hepatitis
- Unexplained myocarditis
- Unexplained pneumonitis
- Unexplained vasculitis
- Organ dysfunction
- Fever, Rash, Influenza like Illness (ILI)
- Arthralgia and non-specific arthritis

3- How to assess parvovirus B19 infection?

-Quantitative PCR assay (TaqMan real-Time PCR assay)

-Parvovirus IgM & IgG detection (ELISA method)

4-Sampling:

- 3 to 5 mL of clotted blood (needed for serological and molecular B19 parvovirus tests)
- 3 to 5 mL of oxalate blood (needed for CBC test)
- Samples are sent to Prof. Alborzi Clinical Microbiology Research Center every day, 8 a.m-10 p.m, including weekends and holidays.

5- Tests results:

- Results are ready on Sunday and delivered 9a.m - 9p.m

6-Treatment options:

- Reduction of immunosuppression grade
- IVIG therapy (400mg/kg/day infusion for 5 days)

7- References

1. Eid, A.J., et al., *Parvovirus B19 infection after transplantation: a review of 98 cases.* Clin Infect Dis, 2006. 43(1): p. 40-8.

2. Gosset, C., et al., *How many times can parvovirus B19-related anemia recur in solid organ transplant recipients?* Transpl Infect Dis, 2012. 14(5): p. E64-70.

3. Eid, A.J. and K.M. Posfay-Barbe, *Parvovirus B19 in solid organ transplant recipients.* Am J Transplant, 2009. 9 Suppl 4: p. S147-50.

4. Maheshwari, A., R. Mishra, and P.J. Thuluvath, *Post-liver-transplant anemia: etiology and management.* Liver Transpl, 2004. 10(2): p. 165-73.