Journal of Institute of Medicine Nepal
Institute of Medicine, Kathmandu, Nepal

OPEN ACCESS

Case Report

JIOM Nepal. 2023 Aug;45(2):64-66.

Relapsing Parvovirus B19 Infection after Intravenous Immunoglobulin in Renal Transplant Recipient: A Case Report

Rabin Nepali[1], Pawan R Chalise[2], Dibya Singh Shah[1]

Author(s) affiliation

[1]*Department of Nephrology, Maharajgunj Medical Campus, Tribhuvan University Teaching Hospital, Institute of Medicine, Maharajgunj, Kathmandu, Nepal*

[2]*Department of Urology and Kidney Transplant Surgery, Maharajgunj Medical Campus, Tribhuvan University Teaching Hospital, Institute of Medicine, Maharajgunj, Kathmandu, Nepal*

Corresponding author

Rabin Nepali, MD, DM
rabinnepali@gmail.com

ABSTRACT

Parvovirus B19 has special affinity to erythroid progenitor cells leading to destruction and inhibition of erythropoiesis. One of its presentations is pure red cell aplasia in patients receiving immunosuppressive medications after organ transplantation. Intravenous immunoglobulin (IVIG) and reduction of immunosuppressive medication has been used for treatment but the effects of IVIG may be temporary. Here we present a case of Relapsing infection due to Parvovirus B19 after IVIG in a renal transplant recipient in Nepal. This case shows that in renal transplant patients presenting with anemia and low reticulocyte count, Parvovirus B19 infection should be suspected. Treatment with IVIG has good results but there may be relapse of infection.

Keywords

Parvovirus B19; intravenous immunoglobulin; renal transplant; relapse;

INTRODUCTION

Parvovirus B19, a member of the Parvoviridae family, is a single stranded DNA virus.[1] It has special affinity to erythroid progenitor cells leading to destruction and inhibition of erythropoiesis.[2] One of the presentations of Parvovirus B19 is pure red cell aplasia in patients receiving immunosuppressive medications after organ transplantation. Its incidence ranges from 6.3-10.3% in renal transplant recipients.[3] Although no specific antiviral drugs are recommended for treatment for parvovirus B19 infection, Intravenous immunoglobulin (IVIG) and reduction of immunosuppressive medication has been used in renal transplant patients. The effects of IVIG may be temporary and there may be relapse of infection. Here we present a case of Relapsing infection due to Parvovirus B19 after Intravenous immunoglobulin in a renal transplant recipient in Nepal.

Submitted
Jun 27, 2023

Accepted
Jul 20, 2023

CASE PRESENTATION

A 24-years-old female with end-stage renal disease due to Chronic glomerulonephritis received a living donor renal transplant from her husband on August of 2022. She received induction immunosuppression with anti-thymocyte globulin 1 mg/kg on day 0 and day 1 and maintenance immunosuppression with tacrolimus, mycophenolate mofetil and prednisolone.

She was discharged on 18th postoperative day with a serum creatinine of 112 micromol/l. Her hemoglobin on discharge was 8.4 g/dl. On her follow up, her serum creatinine rose to 176 micromol/l with a tough tacrolimus level of 12 microgram/l and she underwent renal biopsy. Renal biopsy showed acute tubular necrosis. After adjusting tacrolimus dose, her serum creatinine came down to 134 micromol/l.

After 2 months of follow up, her hemoglobin level started to decrease to 7 g/dl with WBC count of 5500/cmm and platelets count of 374000/cmm. She had no history of blood loss and workup for anemia with serum ferritin, transferrin saturation, vitamin B12, Folate, serum Lactate dehydrogenase, upper GI endoscopy and stool for occult blood were all within normal limits. Her serum hemoglobin further decreased to 5.4 g/dl with a reticulocyte count of 0.4%. She was admitted and was transfused 2 units of packed red cells. Parvovirus B19 polymerase chain reaction (PCR) was positive with a viral load of >10 million IU/ml. She received 5 doses of intravenous immunoglobulin (IVIG) at dose of 400mg/kg/day and her dose of mycophenolate mofetil was decreased to 250mg twice daily. On subsequent follow up, her hemoglobin increased gradually to 8.7 g/dl to 12.5 g/dl with reticulocyte count of 2.5%, 6 weeks after IVIG treatment. But after 3 months, she again presented to Outpatient department with easy fatiguability with a hemoglobin level of 7g/dl. She received blood transfusion and Parvovirus B19 PCR again showed viral load of more than 10 million IU/ml. She has been planned for second dose of IVIG.

DISCUSSION

Since its discovery in 1975,[4] Parvovirus B19 infection is a common throughout the world. Its clinical presentation ranges from Fifth disease/erythema infectiosum in children, Arthropathy, Transient aplastic crisis, fetal infection leading to non- immune hydrops fetalis to pure red cell aplasia in immunocompromised patients.[3] In immunocompetent hosts, there is protection against parvovirus B19 by producing specific antibodies. Antigen-antibody immune complex are formed and patients may present with arthralgia, arthritis, and/or an exanthem. But in immunocompromised individual like our patient who is a renal transplant recipient under continuous immunosuppressive medications, they are not able to produce significant immune response to parvovirus B19. So, they can suffer from extended bouts of infection with state of persistent anemia caused by lytic destruction of proerythroblasts leading to acquired pure cell aplasia. In a meta-analysis in renal transplant patients, the overall estimated incidence of positive parvovirus B19 DNA was 10.3% and in renal transplant patients with anemia, the incidence rate was 27.4%.[5]

In immunocompromised patients, the possibility of Parvovirus B19 infection should be suspected in patients with severe anemia and paradoxically low reticulocyte count. Diagnosis is made by detection of parvovirus DNA through PCR testing.[6] There are no specific antiviral drugs available for treatment of Parvovirus B19 infection. In immunocompromised patients with chronic infection and anemia, IVIG at dose of 400mg/kg/day for five consecutive days and reduction of immunosuppression is recommended.[7] The benefit of IVIG is due to the passive transfer of Parvovirus B19 specific immunoglobulins G antibodies but the effect maybe temporary and there are several case reports of relapse with recurrent anemia despite treatment.[8] In a study of Eid et al, despite therapy, up to 28% of Solid organ transplant recipients and 9.5% of hematopoietic stem cell transplant recipients experienced relapse with recurrent anemia after receiving IVIG.[9] Repeated courses of IVIG are recommended for recurrence of infection.

There has been few case reports of Parvovirus B19 in renal transplant recipients in Nepal[10] but this is a first case of relapsing infection of Parvovirus B19 after IVIG to be reported from our institute and probably from Nepal. Even though anemia is a common finding post transplantation, we generally do not suspect Parvovirus infection because of more common causes of anemia associated with renal transplant, our lack of knowledge and our financial constraints to test every case of anemia for Parvovirus. But this case shows that parvovirus B19 infection should be suspected in renal transplant recipient with severe anemia and low reticulocyte count.

CONCLUSION

In renal transplant patient presenting with anemia and low reticulocyte count, Parvovirus B19 infection should be suspected. Treatment with IVIG has good results but there may be relapse of infection.

CONSENT

Written informed consent was obtained from the patient for publication of this case report.

FINANCIAL SUPPORT

The author(s) did not receive any financial support

for the research and/or publication of this article.

CONFLICT OF INTEREST

The author(s) declare that they do not have any conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

1. Young NS, Brown KE. Parvovirus B19. N Engl J Med. 2004;350(6):586-597. doi:10.1056/NEJMra030840
2. Heegaard ED, Brown KE. Human parvovirus B19. Clin Microbiol Rev. 2002;15(3):485-505. doi:10.1128/CMR.15.3.485-505.2002
3. Porignaux R, Vuiblet V, Barbe C, et al. Frequent occurrence of parvovirus B19 DNAemia in the first year after kidney transplantation. J Med Virol. 2013;85(6):1115-1121. doi:10.1002/jmv.23557
4. Cossart YE, Field AM, Cant B, Widdows D. Parvovirus-like particles in human sera. Lancet Lond Engl. 1975;1(7898):72-73. doi:10.1016/s0140-6736(75)91074-0
5. Thongprayoon C, Khoury NJ, Bathini T, et al. Epidemiology of parvovirus B19 and anemia among kidney transplant recipients: A meta-analysis. Urol Ann. 2020;12(3):241-247. doi:10.4103/UA.UA_89_19
6. Saldanha J, Lelie N, Yu MW, Heath A, B19 Collaborative Study Group. Establishment of the first World Health Organization International Standard for human parvovirus B19 DNA nucleic acid amplification techniques. Vox Sang. 2002;82(1):24-31. doi:10.1046/j.1423-0410.2002.00132.x
7. Eid AJ, Chen SF, AST Infectious Diseases Community of Practice. Human parvovirus B19 in solid organ transplantation. Am J Transplant Off J Am Soc Transplant Am Soc Transpl Surg. 2013;13 Suppl 4:201-205. doi:10.1111/ajt.12111
8. Renoult E, Bachelet C, Krier-Coudert MJ, Diarrassouba A, André JL, Kessler M. Recurrent anemia in kidney transplant recipients with parvovirus B19 infection. Transplant Proc. 2006;38(7):2321-2323. doi:10.1016/j.transproceed.2006.06.116
9. Eid AJ, Brown RA, Patel R, Razonable RR. Parvovirus B19 infection after transplantation: a review of 98 cases. Clin Infect Dis Off Publ Infect Dis Soc Am. 2006;43(1):40-48. doi:10.1086/504812
10. Baral A, Poudel B, Agrawal RK, Hada R, Gurung S. Pure red cell aplasia caused by Parvo B19 virus in a kidney transplant recipient. J Nepal Med Assoc. 2012;52(186). doi:10.31729/jnma.73