Article published online: 2023-09-22

Letter: Parvovirus B19 Related Severe Aplastic Anaemia following Liver Transplantation

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J Gastrointest Infect 2023;13:56–58.

A 58-year-old male underwent living donor liver transplantation for nonalcoholic steatohepatitis-related cirrhosis complicated with ascites, upper gastrointestinal bleeding, and hepatic encephalopathy. He was a known case of long-standing diabetes mellitus, systemic hypertension, and ischemic cerebrovascular stroke. Following an uneventful stay, he was discharged after 15 days on tacrolimus 1 mg twice a day, mycophenolate mofetil (MMF) 500 mg/day, prednisolone 15 mg/day, fluconazole 200 mg/day, valganciclovir 450 mg twice daily, and other medications for his comorbid states. The blood investigations showed stable graft function: alanine aminotransferase (AST) 9 U/L, aspartate aminotransferase (ALT) 34 U/L, total bilirubin 0.66 mg/dL, low hemoglobin 8.6 g/dL with normal total leucocyte count (TLC) 8870 cells/mm^3 and platelets 300,000 /mm^3, and adequate tacrolimus trough levels (6.9 ng/mL). Two weeks later, he presented with fatigue and dyspnea on exertion. Investigations revealed hemoglobin 5.8 g/dL, TLC 3370 cells/mm^3, and platelets 289,000/mm^3. Iron indices and vitamin B12 levels were normal. Reticulocyte count was 0.1%. Peripheral smear examination revealed normocytic normochromic anemia. His graft function was good with AST 12 U/L, ALT 30 U/L, total bilirubin 0.63 mg/dL, and tacrolimus trough level was 5.9 ng/mL. Cytomegalovirus and Epstein–Barr virus serology and viral load test using enzyme immunoassay and real-time polymerase chain reaction (PCR) were negative. His hemoglobin remained low (5.8–6.6 g/dL) in spite of two transfusions. Bone marrow examination showed severe red cell hypoplasia, giant erythroblasts with prominent eosinophilic intranuclear viral inclusions. These findings are consistent with parvovirus B19 (B19V) infection (►**Fig. 1**). B19V immunoglobulin (Ig) M (enzyme immunoassay) was positive and B19V deoxyribonucleic acid levels (real-time PCR) were 1.27×10^{10} copies/mL. In view of these findings, his immunosuppression was optimized; MMF was stopped. His tacrolimus trough level was 5.3 ng/mL. He received intravenous Ig (IVIG) 400 mg/kg/day for 5 consecutive days. His hemoglobin level still remained low and he required more blood transfusions. Two cycles of IVIG were repeated after 20 and 40 days from the first dose. After the third dose, there was a dramatic response with rise in hemoglobin and TLC (►**Fig. 2**). Currently, he is 1-year posttransplant and doing well. Repeat bone marrow biopsy and viral serology were not done.

Anemia in postliver transplant period may be related to persisting hypersplenism, gastrointestinal bleeding, concomitant renal failure, adverse drug reactions to immunosuppressant drugs, nutritional deficiencies, and bone marrow suppression secondary to viral infections.[1–3] B19V infections have been described commonly in hematopoietic stem cell transplant recipients and renal transplantation. Only a handful of cases have been reported in liver transplant recipients and may be related to lesser immunosuppression in this group. In postliver transplant patients, infection with B19V commonly presents as pure red cell aplasia, pancytopenia, fever, and arthralgia followed by rash and carditis.[4,5]

received
May 16, 2022
accepted after revision
June 4, 2022

DOI https://doi.org/10.1055/s-0042-1757489.
ISSN 2277-5862.

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

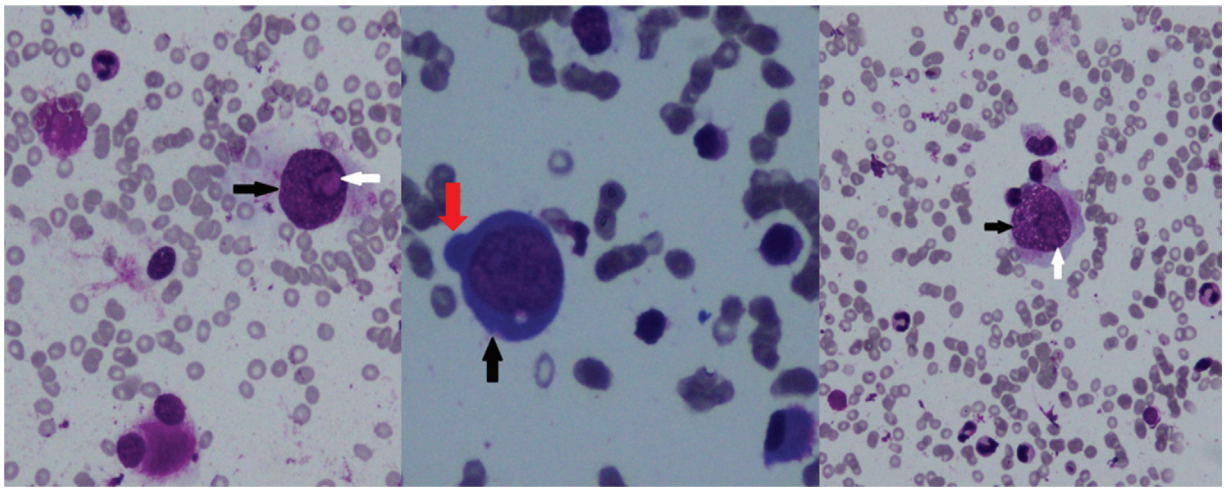

Fig. 1 Bone marrow examination showing erythroid hypoplasia with giant erythroblasts (black arrows) with clear intranuclear viral inclusions (white arrows) and dog-ear like projections from erythroblast cytoplasm (red arrow), consistent with parvovirus B19 infections.

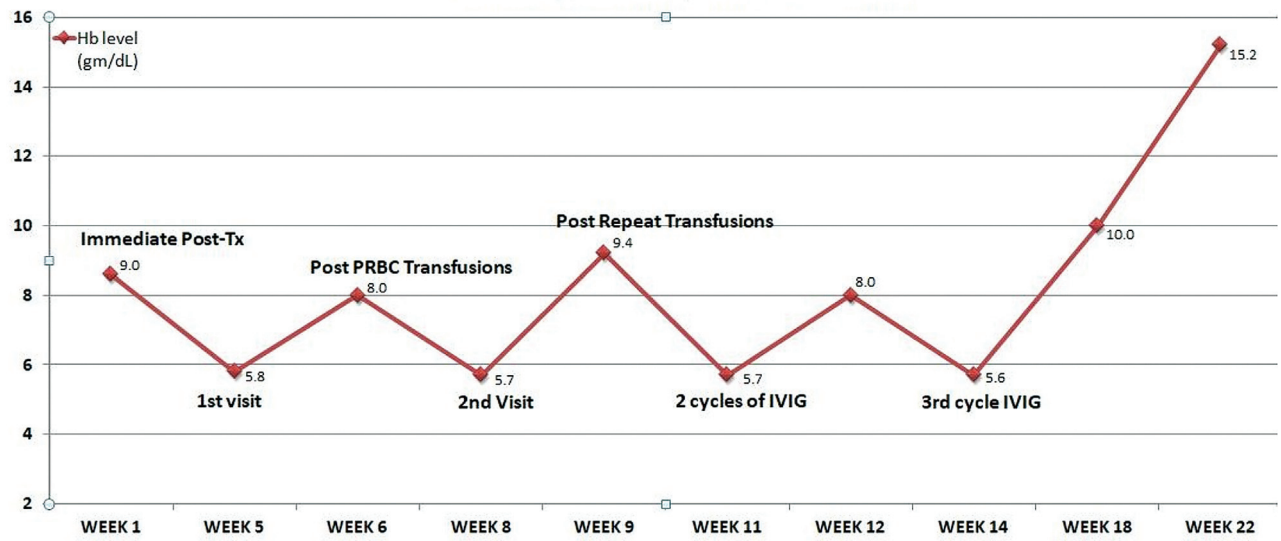

Fig. 2 Hemoglobin levels over the course of illness—response to packed red blood cell (PRBC) transfusion and intravenous immunoglobulin (IVIG).

B19V infection of the liver has been associated with poor outcomes in patients with cryptogenic acute liver failure.[6] Some patients may present with fulminant hepatic failure and aplastic anemia requiring liver transplant and bone marrow transplantation.[7] B19V infection should be considered in sudden decline in hemoglobin or transient aplastic anemia. The diagnosis is confirmed by serology (IgM and IgG positivity), PCR testing, and in situ hybridization in histological specimens. While there is no specific therapy, a triple drug regimen (of Ig, dehydrohydrocortisone, and cyclosporine) has been reported to be effective.[8] IVIG therapy has been reported to be effective and usually, a dose of 400 mg/kg/day for 5 days is used. The relapse rate is nearly 28% and these relapses are managed with a further course of IVIG.[9] Another important aspect of treatment is the optimization of immunosuppression and attaining the delicate balance between good graft function and minimum dose.

To conclude, the present case highlights that B19V infection is a rare but important cause of severe anemia in liver transplant recipients. Prompt testing and treatment would reduce the risk of bone marrow failure, morbidity, and mortality.

Ethical Statement
Informed consent to publish obtained.

Authors' contribution
S.P., D.J., S.R.: Patient care, initial draft. M.J.: editing, analysis and preparing the manuscript.

Data Availability statement
The relevant data are provided in the manuscript.

Conflict of Interest
None declared.

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