Primary Human Parvovirus B19 Infection in an HIV Infected Patient on Antiretroviral Therapy


Abstract

Introduction: Persons with HIV infection frequently present with anaemia from different causes, including use of antiretroviral therapy (typically zidovudine), iron deficiency, vitamin B12 deficiency, opportunistic infections (such as mycobacterial and fungal infections), chronic disease, AIDS-associated malignancies, autoimmune haemolysis, and direct effects of HIV infection itself. Persistent infection with Parvovirus B19 (B19) is an important treatable cause of anaemia in HIV-infected patients.

Case Presentation: We present a case of anaemia in HIV positive patient who did not respond to change of drug therapy and nutritional supplements. Bone marrow biopsy suggested parvo virus infection.

Conclusions: Chronic anaemia due to Parvo virus B19 infection is a treatable cause. Human Parvo virus B19 infection is a diagnosis of exclusion in patients who are started on antiretroviral therapy develop anaemia and later not responding to empirical management. Chronic anaemia requiring recurrent transfusions in HIV positive patient Parvo virus infection should be suspected and evaluated.

Case Presentation

A 42 year old married male presented with exertional breathlessness and easy fatigability since 5 months. Patient complained of exertional breathlessness on walking for short distances of approximately 100 meters. No history of chest pain, palpitations or cough. No history of any gum or rectal bleeding. No history of fever. Patient is HIV positive, was detected and confirmed on 27/02/2002 with a CD4 count of 593 cells/mm3. Patient was not started on antiretroviral therapy, was counselled at private hospital. In June 2011, patient had distension of abdomen and swelling in neck on the right side. Ascitic fluid analysis suggested tubercular peritonitis and fine needle aspiration cytology of lymph node showed necrotising lymphadenitis with caseating Koch’s lesion. Patient was started on Category I Antitubercular therapy for tubercular abdomen. A month later patient was registered at ART (Antiretroviral therapy) centre and started on antiretroviral therapy (Zidovudine, Lamivudine and Nevirapine therapy) with CD4 count of 194 cells/mm3.

On examination, patient appeared pale. His pulse rate was 104/min, collapsing type with a blood pressure of 110/40 mm Hg. General physical examination did not reveal signs of any other nutritional deficiencies. There were no lymphadenopathy, icterus, nail or hair changes, gum bleeding or petechiae. Abdominal examination was normal with no organomegaly or free fluid. Cardiovascular system examination revealed tachycardia with normal apex beat and heart sounds. Soft systolic murmur was heard in the pulmonary area and other examination was normal.

Investigations revealed haemoglobin of 5 gm/dl with peripheral smear showing reduced red blood cells with a mixture of microcytes and macrocytes with varying degrees of hypochromia, normal leucocytes and thrombocytes and a low reticulocyte count. Initially anaemia was attributed to zidovudine and the regimen was changed to stavudine regimen and patient was transfused blood, started on haematinics and...
asked to review. Patient again presented with low haemoglobin levels after 2 months and repeated haemoglobin showing 4.8 gm/dl. Serum ferritin, Vitamin B12 and folic acid levels were normal. Bone marrow biopsy revealed mild increase in erythropoietic series with normoblastic maturation with few megakaryocytes with M:E ratio 2:1 (Figure 1). Also proerythroblasts showed punched out clear nuclear inclusions with features suggestive of erythroid hyperplasia with parvovirus infection (Figure 2 & 3). Myeloid and megakaryocytic series were normal in number and morphology. Patient was given repeated blood transfusions and continued with HAART.

Discussion

Parvoviruses, members of the family Paroviridae, are small (diameter, 22 nm), non-enveloped, and icosahedral-shaped viruses with a linear single-strand DNA genome of 5000 nucleotides. These viruses are dependent on either rapidly dividing host cells or helper viruses for replication. B19V exclusively infects humans. By the age of 15 years, 50% of children have detectable IgG; this figure rises to > 90% among the elderly. In pregnant women, the estimated annual seroconversion rate is 1%.1

Many immunocompromised hosts have pre-existing antibody to B19 or may be able to mount a sufficient imunoresponse to primary infection. The most common consequence of persistent infection is pure red cell aplasia, resulting in chronic or recurrent anaemia with reticulocytopenia.2 In an immunocompromised host like HIV/AIDS with chronic anaemia requiring frequent blood transfusions, Parvovirus B19 infection should be suspected.

The diagnosis of parvovirus B19 infection is established when the following criteria are met: a bone marrow biopsy sample shows pure red cell aplasia or hypoplasia with giant pronormoblasts and intranuclear inclusions; there is serum IgM positivity and/or bone marrow positivity for parvovirus B19 DNA; and no alternative explanation for anaemia can be demonstrated.3

The correct management of chronic pure red cell aplasia caused by parvovirus B19 in persons with HIV/AIDS is unclear. Several IV IG regimens have been used with good results in these immunocompromised persons suffering from chronic anaemia. An alternative explanation for anaemia must be sought in those patients who do not respond to IVIG. Persons with CD4+ T-cell counts under 80/µL may relapse within 6 months, necessitating re-treatment with IVIG. A maintenance dose may be required to prevent relapse.4 Aggressive antiretroviral treatment may effectively diminish transfusion requirements among HIV-infected individuals with pure RBC aplasia resulting from parvovirus B19 infection. Highly active antiretroviral treatment that includes a protease inhibitor may be effective and, possibly, even eliminate the need for transfusions and IVIG therapy among HIV-infected individuals who develop chronic anaemia due to parvovirus B19.5 Up to 25% of severe chronic anaemia in AIDS has been ascribed to B19 infection. But initiating HAART has been beneficial in reversing B19 associated anaemia, and is linked with return of humoral responses.
Conclusion

In this case, a primary Parvo virus B19 infection was diagnosed in an HIV seropositive patient already on antiretroviral therapy. The introduction of HAART is associated with reconstitution of immune responses, including humoral immunity. Hence treatment of HIV by antiretroviral therapy has shown to stimulate reconstitution of humoral and cell mediated immune competence on human parvovirus B19. Thus Human Parvo virus B19 infection is a diagnosis of exclusion in patients who are started on antiretroviral therapy develop anaemia and later not responding to empirical management.

Acknowledgement

We would like to acknowledge our beloved Director, Medical Superintendent, Principal, VIMS, Bellary for allowing us to do this study and publish this case report. Also we would like to acknowledge the patient who consented for study and publishing details.

References