Case Report :

Zidovudine-Induced Anemia in HIV/AIDS

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Abstract :

Patients infected with human immunodeficiency virus-1 (HIV-1) are at increased risk of developing severe haematological complications when they are in highly active anti retroviral therapy (HAART). Although there is a proven adverse drug reactions with those drugs, but it can be manageable with some supplement therapy which had seen in this case. We report a patient infected with HIV-1 positive that she was on regular treatment with Zidovudine (AZT), Lamivudine (3TC) and Nevirapine (NVP) for the past 2 months developed with the complaints of vomiting, decreased appetite (1month) and rapid breathing. The patient diagnosed with HIV and was started with the regimen Zidovudine, Lamivudine, and Nevirapine.. During his next review after a month, the patient was subjected to laboratory investigations which showed abnormalities in hematological parameters. Hemoglobin-2.8 g/dl, RBC- 1.06×10 6/mm3 , HCT-8.1%, MCH-19pg, MCHC-22.7g/dl, RDW-37%. In view of adverse effects with Zidovudine, the regimen was switched to Abacavir, Lamivudine and Nevirapine. Before initiating the Zidovudine containing ART regimen, it is essential to monitor the hematological parameters of the HIV-1 infected patient. Health care providers may consider this fact to bring good outcomes in HIV infected patients.

Keywords:

Human Immunodeficiency virus, adverse drug reaction, Zidovudine, Anemia

Introduction:

AIDS is a severe immunological disorder caused by the retrovirus HIV, resulting in defect cell mediated immune response. It is estimated that approximately, 7 million people who live with AIDS can now access highly active antiretroviral therapy (HAART). The increasing number of patients receiving HAART therapy has lead to reduction in AIDS related morbidity and mortality. However, some patients need to change HAART medicines owing to their toxicity.1) HAART is the combination of several antiretroviral medicines used to slow the rate at which HIV make copies of itself in the body. A combination ART is the current standard of care for treating patient with HIV/AIDS, which is more effective than just one medicine (monotherapy) to treat HIV. Combination therapy consisting of 2 nucleoside analogues [either Zidovudine or Stavudine along with Lamivudine] and one non-nucleoside reverse transcriptase inhibitor (NNRTI) [either Nevirapine (NVP) or Efavirenz (EFV)] are frequently used.2) AZT, a nucleoside reverse transcriptase inhibitor (NRTI) is one of the earliest antiretroviral agents used as a combination in some of the HAART regimens for the treatment of HIV/AIDS and it was the first drug approved by the US FDA, preferred mostly by the National AIDS Control Organization (NACO) sponsored ART centres in India.(3) Anemia is a very common finding in patient with HIV infection, particularly in individuals with more advanced HIV disease treating with Zidovudine. The epidemiological studies from various parts of the worlds shows that the

prevalence of Zidovudine induced anaemia vary widely with 5.42- 9.62% (3). Over the years, there has been a decreased in the recommended dose of Zidovudine from 1500mg/day to 600mg/day, which has improved tolerability. In patient with CD4+ cell counts > 100 cells/ml, hematologic effect occurs in 2%-14% patients. However, the incidence is much greater among the patient with CD4+ cell counts

Case Report:

A nine year Female patient was diagnosed with HIV-1 infection undergone regular treatment with Zidovudine, lamivudine and Nevirapine combination was on routine medical examination. He was asymptomatic and then she developed vomiting, decreased appetite (1month) and rapid breathing. Patient was brought with tachypnea and tachycardia. Liver of 2.5 cm with span of 10cm,Spleen was just palpable. Haematological parameters showed RBC-1.06×106 /mm3 , Hb 2.8g/dl (Normal range 11-16 g/dl), HCT 8.1% (Normal range 35-50%), MCH 19 pg (Normal range 26-33 pg), and MCHC 22.7 g/dl (Normal range 31-35 g/dl), HBsAg-negative, Serum Total cholesterol -160mg/dl (Normal range 130-220 mg/dl), Triglyceride level - 99 mg/dl (Normal range up to 170 mg/dl). His CD4 count was found to be 185cells/mm3. Assessing the patient medication chart we suggested that it was Zidovudine induced anemia. The patient was treated with 5cc/kg of PRBC transfusion and cbc was repeated which showed (Hb-4.1, Tc-5,Plt-112). Again PRBC transfusion was given by 10cc/kg after that cbc showed (Hb-6.8, Tc-3.3,Plt-96).Vitamin B12 and folic acid were normal. In view of adverse effects with Zidovudine she was shifted to a combination therapy to ABACAVIR and she was sent to PPTCT. Now the patient is following up with us with ABACAVIR, LAMIVUDINE and NEVIRAPINE.

Discussion:

Anti retro viral therapy are associated with several adverse events such as peripheral neuropathy, myopathy, pancreatitis, nephrotoxicity, lactic acidosis, hepatic steatosis and bone marrow suppression. The most common adverse effects of Zidovudine include bone marrow suppression (Anemia and Neutropenia), nausea, malaise, myalgia, insomnia and headache. Bone marrow toxicity appears to be more common in those patients with advanced disease and is related to dose and duration of the treatment. The AZT-induced anemia is rather unique and can be properly managed. The exact mechanism of anemia is still unknown. It was hypothesized that AZT may suppress erythropoesis or inhibit erythroid stem cells, thus ensuring pure red-cell aplasia (i.e; decreased reticulocyte counts and hemoglobin levels without hemolysis or blood loss), increasing MCV and elevating erythropoietin level. The AZT-induced anemia clearly presented after 4 weeks of AZT-based therapy and the high prevalence started from 4-24 weeks (or 1-6months). This could probably explain why iron supplements, folic acid (or Vit B12), or blood transfusions can be used to manage the anemia based on its severity. More recent studies of combination antiretroviral therapy have confirmed the relative low incidence of severe anemia at lower doses of zidovudine. Despite these findings, many patients receiving the drug in clinical practice will require occasional transfusion or change in drug therapy to ameliorate this toxicity.

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