A STUDY ON SPECTRUM OF ANEMIA IN HIV INFECTED PATIENTS ON TREATMENT IN A TERTIARY CARE HOSPITAL.

Pathology

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ABSTRACT

Aim: To study the severity of anemia and to categorize the patterns of anemia in patients infected with HIV. **Materials and Methods:** This is a prospective study carried out in the Department of Pathology, GMKMC, Salem for a quarterly period in 2018. Venous blood samples were collected from HIV infected patients, subjected to Complete hemogram analysis and peripheral smears were made. **Results:** In our study group of 200 HIV infected patients with anemia, mean hemoglobin concentration was 9.5 g /dl. Mild Anemia was seen in majority of the patients (50.5%). The most common pattern of anemia was Normocytic Normochromic Anemia seen in 83 patients (41.5%). **Conclusion:** Anemia in HIV patients is a predictor of disease progression. Early detection and treatment of Anemia in HIV patients is mandatory to reduce the Morbidity and Mortatlity.

KEYWORDS

Anemia, Hemoglobin, Human Immuno Deficiency Virus, Normocytic normochromic.

INTRODUCTION

In India, 2.1 million people are living with Human Immune Deficiency virus (HIV), infection with prevalence rate of 0.2% in adults 1. New infections are 88,000 cases and AIDS related deaths increased from 62,000 to 69, 000 2. Anemia is the commonest hematological abnormality in people infected with Human Immune Deficiency virus (HIV), accounting for 70 %.3 The factors accentuating anemia in HIV patients are female sex, low CD4 count, high viral load, low vitamin D level, therapy with Zidovudine, Ganciclovir, medication for hepatitis C and opportunistic infections. The infection itself causes changes in cytokine production and enhances apoptosis of erythroid precursors and also directly suppresses erythropoiesis and bonemarrow stromal elements. Other causes are autoimmune hemolytic anemia and HIV related lymphoma. Anemia causes progression of disease course and increases morbidity and mortality. Other associated hematological abnormalities are thrombocytopenia and leucopenia. In this study, an attempt has been made to study the spectrum of anemia in HIV infected patients .

Aims and Objectives

To study the severity of anemia and to categorize the patterns of anemia in patients infected with HIV.

Materials and Methods.

Venous blood samples were collected from the HIV infected patients being referred to clinical pathology laboratory in EDTA tubes. These samples were immediately subjected to Complete hemogram analysis This study is a prospective study carried out in the Department of Pathology, Government Mohankumaramangalam Medical College Hospital, Salem district of Tamilnadu for a quarterly period in 2018 (RBC count, WBC count, Hemoglobin, Hematocrit, platelet count, Mean corpuscular volume, Mean corpuscular hemoglobin and Mean corpuscular hemoglobin concentration and Red cell distribution width using fully automated three part hematology analyser. Peripheral smears were prepared, stained with leishman stain and interpreted. In those with moderate to severe degree of anemia, reticulocyte count estimation was done manually using a peripheral smear stained with new methyleme blue. Bone mrrow aspiration was done in 12 patients under strict aseptic precautions with local anesthesia, smears prepared, stained with leishman stain and examined for cellularity.

Inclusion Criteria

Both Male and Female HIV infected patients on treatment with hemoglobin less than 11g/dl irrespective of the age group and treatment strategy

Exclusion Criteria

1) Patients with hemoglobin more than 11 g/dl
2) Other co morbid medical conditions

Observation and Results

In our study group of 200 HIV infected patients with anemia, age of the patients ranged from youngest age of 1 year to oldest age of 75 years. Peak age group was 30 to 40 years
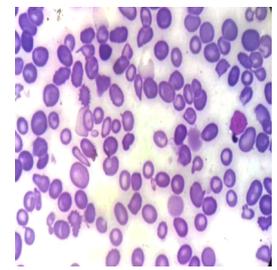
Table 1 AGE wise Distribution curve

Age	Numbers	Percentage
<14 years	9	4.5
14-20 years	13	6.5
21-30 years	25	12.5
31-40 years	64	32
41-50 years	53	26.5
51-60 years	24	12
61-70 years	11	5.5
>70 years	1	0.5

Predominant of the patients were in the age group of 30-40 years (32%), followed by 40-50 years (26.5%) . Pediatric age group constituted about 4.5 % of the study population. Out of the 200 HIV infected patients ,there were 48 males and 152 females with male : female ratio of 1 :3.
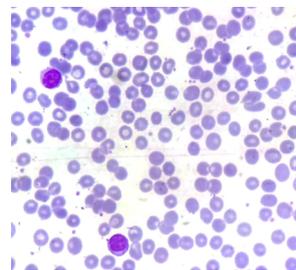
Fig 1 Normocytic Anemia   **Fig 2 Dimorphic Anemia**

Table -2 Distribution according to WHO grading of severity of Anemia

Hb in g/dl	Number of patients	Percentage
Mild (9.5 to 10.9)	101	50.5
Moderate (8-9.4)	69	34.5
Severe (6.5 -7.9)	21	10.5
Life threatening (<6.5)	9	4.5

Mean hemoglobin concentration was 9.5 g /dl. Mild Anemia was seen in majority of the patients (50.5%) followed by moderate degree of anemia (34.5%) . All the 21 patients with severe anemia had CD4 count less than 200/µl .Mean Hematocrit was 28.09

According to peripheral smear and red cell indices , the most common pattern of anemia was Normocytic Normochromic Anemia seen in 83 patients (41.5%) (Fig 1) ,followed by macrocytic anemia noticed in 70 patients(35%). Microcytic hypochromic anemia constituted 41 cases (20.5%) and Dimorphic Anemia was seen in 6 patients (3%) which

comprised of Microcytic and Macrocytic blood picture.(Fig 2)

Mean MCV of the patients was 90.16 fl .Mean MCH was 29 pg.Mean MCHC was 31.7%. Value of Red cell distribution was high in 40 cases (20%) indicating the severity of anisopoikilocytosis. Mean RDW was 52.5

Reticulocyte count was found to be very low compared to the degree of Anemia .

Mean reticuloyte   count was 0.8 .Other cytopenias noted were –thrombocytopenia in 68 patients (34%) and Leucopenia in 21 patients (10.5%).One patient (0.5%) was found to have chronic Lymphocytic Leukemia.Bone marrow aspiration was done in 12patients . Bone marrow was hypocellular in 58 %, Hypercellular in 29% and normocellular in 13%

DISCUSSION
HIV infection causes diverse clinical manifestations. Hematological involvement is one among the very common abnormality ,Anemia being the most commin cytopenia.

The main mechanism of anemia   is disruption of bone marrow cytokine homeostasis.

HIV is cytotoxic to T helper cell lymphocytes leading to disruption of B cells and alteration of cytokine release.HIV infected T cells directly suppresses the growth of bone marrow progenitors thus suppressing hematopoeisis.Antiretoviral therapy causes anemia ,Macrocytosis ,Pure Red cell Aplasia ,Megaloblastic anemia ,Neutropenia and Thrombocytopenia.Other causes of anemia in HIV patients are Gastrointestinal hemorrhage , opportunistic infections ,malignancy and rarely hemolysis.Studies have shown elevated Tumour Necrosis Factor in serum of HIV infected persons which s an important mediator of anemia of chronic disease.The present study included 200 anemic patients infected with HIV on treatment Anemia was defined by the WHO criteria of Hemoglobin level less than 11 g/dl. In our study the majority of the patients had Mild to Moderate degree of anemia 86.   In a study by Mohsen Meiden et al mild to moderate anemia was seen in 67% of patients4   In a study by Calis et al prevalence of mild to moderate anemia in HIV infected children varied between 24-82 %5 In another study by Ranezani et al severe anemia was not observed6. However We observed   severe anemia in patients with advanced stage of the disease (AIDS) than in HIV itself.

The most common morphological type of anemia in our study was normocytic normochromic   (41.5%) which is similar to studies by Agarwalls et al, Kasturi et al and Tirupathy et al7,8,9. Macrocytic Anemias was seen in 35% of patients in our study. This is almost similar to the study   by Ajay Panwar et al10.   Unlike observed by Mata- Marin et al,where   there was no macrocytic anemia11.89% of the patients with macrocytic anemia were taking Antiretroviral therapy. Studies by   Agarwal et al, Tripathi et al have also reported similar observation in Indian HIV patients taking   ART.

In our study Microcytic Hypochromic Anemia was seen in 20.5% of patients which is more or   less similar to the study by Rajeswari et al in which microcytic anemia was present in 13.In most   of the studies ,the most common anemia in HIV infected individuals is Anemia of Chronic Disease12.Red cells are initially normocytic and normochromic . When infection is chronic or   recurrent Red blood cells will become Microcytic and Hypochromic. RDW is an indicator of   degree of anisopoikilocytosis in Peripheral smear. If RDW is high there are chances of Iron   Deficiency Anemia13. In our study RDW value was in normal range in 160 cases (80%) and   higher in 40 cases (20%). RDW correlate with the percentage of Microcytic Hypochromic anemia which could be due to Iron Deficiency In our study Thrombocytopenia was noted in 34% and in a study by Zon et al 40% had   thrombocytopenia14   Bone marrow aspiration study showed 58% of smear as Hypercellular. This highlight the   disruption of Bone marrow Cytokine Homeostasis by HIV infection

Conclusion
Anemia in HIV patients is a predictor of disease progression and it has an impact on quality of   life. Detection of Anemia in HIV patients emphasizes to look for any internal bleeding and also to find the offending drug, so that implicated drugs can be changed and Iron ,Folate and vit B12   deficiencies if present could be treated. Early detection and treatment of Anemia in HIV patients   is mandatory to reduce the Morbidity and Mortatlity.

REFERENCES
1) World Bank Data ; India (accessed September 2017)
2) UNAIDS (2018) "AIDS Info" (Accessed September 2018)
3) AIDS INFONET.ORG,
4) Mohsen Meidane, Farshield Rezaei et al . Prevalance ,Severity and related factors anemia in HIV ,AIDS patients . Journal of research in Medical Sciences , 2012: 17(2) ;138-42
5) Calis JC, Van Hensbrook MB, de Haan R et al. HIV associated Anemia in Children. A systemic review from a global perspective. AIDS 2008 : 22 ;1099-112.
6) Ramezani A, Agha Khani A, Shary MR et al. Anemia Prevalance and related factors in HIV infected patients . A cohort study. Iran J Pathology. 2008: 3; 125-8
7) Agarwal D, Chakravarthy J, Chaube L, Rai M, agarwal NR, Sundar S . High Incidence of Zidovudine induced anemia in HIV infected patients in Eastern India ., Indian J Med Res ,2010;132:386-9
8) Kasthuri A, Sanjeevan S, Karp. A study of Hematological manifestations of HIV infection., Indian J Sex Transmitted Disease 2006; 27 :9-16.
9) Tripathi AK, Miara R, Kaltra P, Gupta N, Ahmad R. Bone Marrow abnormalities in HIV disease ., Journal Assoc Physicians India; 2005;53:705-10
10) Ajay Panwar ,SC Sharma, Sanjeev kumar et al. A study of Anemia in HIV patients., Medical Journal of Dr.D.Y.Patil Vidyapeeth. 2016;Vol 9: 312-318.
11) Mata- Marin JA, Gayatan- Martinez JE etal. risk factors and correlates for anemia in HIV treatment- naïve infected patients: A cross sectional analytical study. BMC Res Notes.2010;3:230.
12) K Rajeshwari , Karunesh kumar , Tejinder Singh et al . Spectrum and risk factors of anemia in HIV infected Indian Children ; Americal Journal of research communication . 2015: Vol 3 (5);111-19.
13) Bain BJ. Pathogenesis and Pathophysiology of Anemia in HIV infection . Curr Opin Hematol 1999: 6; 89-10
14) Zon LI, Arkin C, Groopman JE. Hematological manifestations of the Human Immuno deficiency virus. Br. J. Hematol1987.66.251..