

PREVALENCE OF ANAEMIA IN HIV-INFECTED PATIENTS AT ARV TREATMENT CENTER, ABUTH ZARIA, NIGERIA

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ABSTRACT

Background:

Anaemia in HIV-infected individuals has been known to be a common complication that correlates well with disease progression, patient survival and final outcome.

Objective: To determine the prevalence of anaemia in HAART naïve patients at the Ahmadu Bello University Teaching Hospital (ABUTH), a designated national antiretroviral treatment center

Methods:

This is cross sectional descriptive study of HIV- patients receiving treatment at ABUTH treatment center from March 2002 to September 2005. Study process included documenting patients' bio-data, standardized medical history, hematocrit, reticulocyte counts, bone marrow aspirations and biopsy and CD4+T cell counts. Anaemia in this study was defined as hematocrit of less than 0.36L/L. Results were analysed using SPSS version 11 software.

Results:

Out of 856 patients, 119 (13.9%) had anaemia. Median age of the patients was 34 yrs. Eighty (67.2%) were females while 39(32.8%) were males. Hematocrit levels ranged from 0.13-0.35L/L with a mean of 0.29L/L and SD of 0.48L/L in the anaemic patients and 0.37-0.44L/L mean 39l/l +/-5 SD in the non-anaemic patients. Reticulocyte counts ranged from 2.8-12.3% (median 6.2%). CD4+ cell counts in all patients ranged from 40-1060 cells/ul, 49 (89.1%) of the anaemic patients had CD4 cell counts <350 while

6(10.9%) had CD4 cell counts >350. Twenty one (15.9%) were in stages 1, 36 (26%) were in stage 2, 67 (48.5%) were in stage 3 and 13 (9.4%) were in stage 4 respectively.

Type of anaemia based on morphology found 15.2% with dimorphic blood picture 33.4% with macrocytic picture while 51.4% had normocytic normochromic blood picture.

Conclusions: Anaemia is common in our patients and was more severe in advanced stages of the disease in patients with low CD4+T cell counts.

KEY WORDS: HAART, HIV/AIDS, ARV, ANAEMIA

INTRODUCTION

Anaemia in human immunodeficiency virus (HIV) infections and in acquired immune deficiency syndrome (AIDS) is a recognized problem that occurs either as a complication of the disease or of therapy¹. Anaemia in HIV-infected patients is associated with poor prognosis whereas absence of anaemia or adequate control of the anaemia is associated with improved prognosis².

The anaemia in HIV-infected patients is known to be associated with the onset of opportunistic infections and severity of the infections^{3,4}.

The prevalence of HIV-related anaemia had been determined in a wide range of settings including; anaemia in pre- HAART era, in sub populations such as blacks and in people who developed anaemia in the course of treatment.^{5,6}

Causes of anaemia in HIV-infected individuals are protean and include nutritional

deficiencies (as occurs in def of iron, folic acid and vitamin B12)⁷, bone marrow infiltrations with mycobacterium and lymphoma⁸, adverse effects of certain drugs in use in the management of AIDS (e.g. Zidovudine)⁹ and autoimmune hemolytic mechanisms¹⁰. An important cause of anaemia is the primary infection itself, causing direct infection of haematopoietic precursor cells or by the release of harmful cytokines which suppress red cell production¹¹.

Early determination and characterization of anaemia in HIV-infected patients is essential in the overall management of the primary condition, since control of the anaemia impacts positively on the survival of the patients.

The objective of this study is to determine the prevalence of anaemia in HIV/AIDS patients seen at the ABUTH HIV treatment centre and their possible causes before the commencement of antiretroviral therapy.

Materials and methods

A cross-sectional and descriptive study was conducted on all patients recruited for the highly active antiretroviral treatment (HAART) programme at ABUTH Zaria HIV-AIDS treatment center from March 2002 to September 2005. Inclusion criteria for patient recruitment in the study included; initial reactive screening, confirmation of disease state using western blot or repeat positive serum with ELISA.

All patients underwent pre-screening counseling, confirmation of HIV sero-status using western blot and complete physical examination for disease staging.

Exclusion criteria included previous use of antiretroviral drugs and sickle cell diseases, and those who declined to be included in the study.

All patients had haemoglobin levels, reticulocyte count, bone marrow morphologic studies, and CD4+cell counts.

Blood and bone marrow film morphologies were examined to determine the types of anaemia where appropriate.

Written consent was obtained in all patients. The data was analysed using SPSS version 11 statistical software.

RESULTS

A total of 856 patients; 522(61%) females and 334(39%) males were studied. One hundred and nineteen were anaemic, 80 (67.2%) were females while 39(32.8%) were males. (Table 1) shows the sex and age distribution. A Female: male ratio of 2:1. Age of the subjects ranged from 20-61 years (mean 34 yrs)+-

Haematocrit levels ranged from 0.13-0.35 (l/l) with a mean of 0.29l/l in the anaemic cohorts and 0.37-0.44L/L in the non-anaemic patients with a mean of (0.41L/L). Fifty-five (46.2%) of the anaemic patients had haemoglobin levels less than 0.10L/L while 64 (53.8%) had mild to moderate anaemia with haemoglobin levels between 0.30-0.36L/L. Of the patients who were severely anaemic, 33(60%) were females while only 22(40%) were males. Table 2 shows sex and CD4+ counts in the two groups.

Reticulocyte counts ranged from 2.8-12.3% (median 6.2%), higher reticulocyte counts were recorded in patients with severe anaemia.

CD4+T cell counts in all patients ranged from 40-1060 cells/ul (mean 241). Forty-nine (89.1%) of the severely anaemic patients had CD4 cell counts <350 cell/ul while 9(10.9%) of the severely anaemic patients had CD+4T cell counts >350 cells/ul.(Table 3).

Types of anaemia based on blood film and bone marrow findings included; microcytic/hypochromic (16.2%). Macrocytic anaemia (33.4%), and normocytic normochromic (51.4%).

Of the 119 anemic patients, 21(15.9%) were in stage 1, 36(26%) were in stage 2, 67(48.5%) were in stage 3 and 13(9.4%) were in stage 4 of the WHO classification of the clinical presentation of AIDS.

Table 1 Age vs sex distribution in HIV-infected anaemic patients. (n=119)

Age categorized	SEX		Total
	Male	Female	
20-24	0	6(7.5)	6
25-29	3(7.1)	35(92.9)	38
30-34	7(18)	18(72)	25
35-39	9(50)	9(50)	18
40-44	6(54.5)	5(45.5)	11
45-49	8(57.1)	6(42.9)	14
50-54	3(75)	1(25)	4
54+	3(100)	0	3
Total	39(32.8)	80(67.2)	119(100)

Table 2 Sex vs CD4 T cell categorisations in anaemic patients. (n=119)

Sex	CD 4 Categorized		Total
	<350	350+	
Male	29 (74.4%)	10 (25.6%)	39 (100.0%)
Female	61 (76.3%)	19 (23.8%)	80 (100.0%)
Total	90 (75.6%)	29 (24.4%)	119 (100.0%)

Table 3 PCV vs CD4 T cell distributions in HIV-infected anaemic patients. (n=119)

PCV level(L/L)	CD 4 Categorized		Total
	<350 cells/mm ³	>350 cell/mm ³	
< 0.30	49(89.1)	6(10.9)	55
>0.30	41(64.1)	23(35.9)	64
Total	90(75.6)	29(24.4)	119(100)

Discussions

Of the 856 patients who attended the clinic during the study period 119(16.1%) were anemic

The demographic variables of the subjects in this study were similar to the general variables as obtains in other patients in the clinic

Previous studies on anaemia in HIV-infected patients were mainly carried on Caucasians, but none so far for our centres⁵.

Age and sex of our patients attending the ARV

clinic was skewed towards younger age groups and females; supporting the fact that HIV infection in this community as in others affects mainly females and young people who are sexually active and practice unsafe sex.

The cumulative 16.1% prevalence rate of anaemia in patients in this study lends support to the common occurrences of anaemia in HIV-infected patients. Earlier investigators had suggested that anaemia is common in HIV-infected patients and occurs in

approximately 30% of newly infected and 80%-90% in patients with advanced diseases⁶. In the United States of America prior to the commencement of HAART, the prevalence of severe anaemia was 12%⁷. Our figures of 16% compares with that of Sullivan et al who found 12% in their patients with immunological AIDS, as defined by CD4+ cell counts < 200 cells/ul, and 3% among HIV-infected individuals with neither clinical nor immunologic AIDS⁸. Of particular significance in this study was the predominance of severe anaemia in females with advanced disease more than their male cohorts. We were unable to associate the severity of the anaemia in the females with any variable factor such as plasma viral load which is unavailable in our centre. It should however be noted that anaemia in HIV-infected people is multifactorial which includes bone marrow abnormalities, nutritional, hemolytic and due chronicity of the illnesses⁹.

Types of anaemia as defined by the findings on peripheral blood film pictures and bone marrow morphology were diverse and appeared to be as a result of combined deficiencies of essential elements required for haemopoiesis. It should be noted that more than half of our patients' anaemia had no definitive morphologic abnormality and these could be attributed to either bone marrow infiltrations or due to chronic illness.

A major limitation in our study was our inability to quantify these deficient essential elements required for normal haemopoiesis.

Advanced stages of HIV infections are associated with different degrees of anaemia, which can be attributed to several contributory factors such as; decreased red blood cell production, increased red blood cell destruction and anaemia due to ineffective haemopoiesis^{10,11}.

Anaemia of chronic illnesses is a common finding in patients with advanced stage of AIDS and occurs in many instances due to non-response of the kidneys to low hemoglobin levels, in certain instances where the kidney responds by the release of erythropoietin, the bone marrows fails to

respond to even elevated levels of circulating erythropoietin resulting in ineffective erythropoiesis³.

Autoimmune hemolytic anaemia do occur as a result of immune mediated mechanisms that escape easy diagnosis and is extremely difficult to manage¹². Whatever the cause of the anaemia, the association with HIV/AIDS carries bad outlook.

In this study, patients with mild to moderate anaemia responded well to oral haematinics prescribed based on type of anaemia, while those with severe anaemia required repeated blood transfusion, use of erythropoietin and the use of large dose of steroids in one case.

The study was able to establish the common occurrences of anaemia in all stages of HIV infections in patients attending our facility for treatment. Anaemia was as a result of deficiencies in essential elements required for normal haemopoiesis.

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