 Original Research Article

PREVALENCE OF ANEMIA AMONG HUMAN IMMUNODEFICIENCY VIRUS POSITIVE PATIENTS TAKING HIGHLY ACTIVE RETROVIRAL THERAPY.

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ABSTRACT

INTRODUCTION: Anemia is a global health, affecting more than 1/5th of all people. Many illnesses and disease agents predispose to anemia, including Human Immunodeficiency Virus (HIV). HIV positive individuals face much morbidity and mortality, and anemia makes matters even worse. However, anemia among patients receiving highly active retroviral therapy (HAART) is yet to be explored. **OBJECTIVE:** To determine prevalence of anemia type among HIV positive patient taking HAART. **METHODOLGY:** Study done at department of pathology LUMHS Jamshoro /Hyderabad, from 1st May 2021to 31st October 2021,254 HIV patients (aged 18 years and above) of either gender taking HAART for at least the past 6 months were taken via convenience sampling. After taking written informed consent, patients were asked about their sociodemographic details and medical history along with the inferences obtained from general, physical and systemic examination and baseline hematological examination. The data obtained was analyzed using SPSS. v. 21.0 and MS Excel 365. **RESULTS:** The average age of the participants was 34 (SD 5) years. The bulk of the participants were middle-aged males from a rural background with a moderate socioeconomic standing. Anemia was found in 85.8% of the participants, with the majority of them suffering from mild to moderate anemia and only a handful suffering from severe anemia. Anemia was shown to be more common and severe in different genders, age groups, and socioeconomic levels. **CONCLUSION:** Anemia is highly prevalent among HIV patients taking HAART therapy. Though therapy has known benefits and the prevalence of anemia is seemingly less (than values reported in literature) than untreated patients, the difference is not much. Interesting associations can be noted among the study variable and prevalence and severity of anemia detected in the sample.
KEYWORDS: Anemia, Highly Active Retroviral Therapy (HAART), Prevalence, HIV.

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INTRODUCTION

Anemia, a condition marked with fall in blood hemoglobin concentration, below a certain threshold, is characterized by a reduced oxygen-carrying capacity of red blood cells.[1] This disease condition is a global health problem that affects all ages. The global prevalence of all-ages anemia was 22.8% in 2019. Globally, 54.1% of anemia cases are mild, 42.5% are moderate, and 3.4% are severe. [2] The etiologies of anemia include blood loss, malaria, genetic disorders, and infections, e.g., parasitic, chronic, and viral (including HIV). [2]In persons with HIV, anemia presents an additional burden and can lead to an increase

in mortality and reduced quality of life [3-6] Studies done in low-income settings reported that the prevalence of anemia in HIV-infected persons ranged from 40% to 90%, depending on geographical location and definition of anemia.[7-10] HIV infected women are highly afflicted with anemia with the prevalence ranging from 50% to 80%. [11] Risk factors of anemia in HIV include female gender, advancing HIV disease (CD4 counts<200 cells/ microliter), pregnancy, injection drug-use, and co infection with illnesses that cause anemia. [11, 12] Anemia is strong predictor of death [13] but correction of anemia is associated with reversal of this increased risk. In impoverished nations, anemia treatment is not often considered. This is because to the fact that HIV infection receives the greatest attention, along with its complications such as opportunistic infection. [14] Pakistan is experiencing an HIV pandemic, having progressed from a low prevalence, high risk situation to a concentrated epidemic in early 2003. [15] This study is conducted to examine the impact of highly active retroviral therapy (HAART) on anemia in HIV positive patients and the presently accessible treatment regimens are not found to be successful to get rid of the infection. Treatment with HAART gives benefits of not only extending of life years but it also helps in improving patient's quality of life. Anemia is body's genetically programmed response to illness. [16] If HIV infections are not adequately treated, it results in iron deficiency anemia. This causes decrease in body tissue oxygen resulting in slow and serious damage to body organs. This especially applies to the cardiac musculature, which needs to put more effort to account for the low haemoglobin. A HAART helps in prevention of opportunistic infections in AIDS which are the causes of increase mortality among patients. [17]

OBJECTIVES: To determine prevalence of anemia type among HIV positive patient taking HAART.

METHODOLOGY
254 HIV patients (aged 18 years and above) of either gender taking HAART for at least the past 6 months, having complete hematological values at baseline were studied. Patients with treatment regimen other than HAART and those with pregnancy associated hematological diseases, were excluded from the study. After taking written informed consent, patients were asked about their socio demographic and medical history along with the inferences obtained from general, physical and systemic examination and baseline hematological examination. Fresh blood samples were taken (while observing strict aseptic measures) in tubes without anti coagulative and into the tubes containing anticoagulant EDTA. Complete blood count was be analyzed by automated analyzer. Number and percentages (No & %) were used for express Qualitative data. Mean along with standard deviation (X ± SD) was used to express the Quantitative data. Chi Square Test was used to assess the association of anemia among HIV positive patients taking HAART. P value ≤ 0.05 was considered statistically significant. The data obtained was analyzed using SPSS. v. 21.0 and MS Excel 365.

RESULTS

The average age of the participants was 34 (SD 5) years. The majority of the participants were middle-aged men from a rural background with a moderate socioeconomic standing. Anemia was found in 85.8% of the participants, with the majority of them suffering from mild to moderate anemia and only a handful suffering from severe anemia.

TABLE 01: SUMMARY OF DESCRIPTIVE STATISTICS

Variable		N (%)	P Value
Age	Up to 20	22 (8.7%)	
	21 to 30	57 (22.4%)	
	31 to 40	74 (29.1%)	0.082
	41 to 50	53 (20.9%)	
	51 to 60	48 (18.9%)	
Gender	Male	159 (62.6%)	
	Female	95 (37.4%)	0.038
Socioeconomic Status	Upper	12 (4.7%)	
	Middle	139 (54.7%)	0.072

Residential Status	Lower	103 (40.6%)	
	Urban	111 (43.7%)	
	Rural	143 (56.3%)	0.066
Anemia	Present	218 (85.8%)	
	Absent	36 (14.2%)	0.029
Severity of Anemia	Mild	119 (54.9%)	
	Moderate	87 (39.9%)	0.048
	Severe	12 (5.2%)	

TABLE 01: SUMMARY OF DESCRIPTIVE STATISTICS

Variable		Anemia		P Value
		Present(218)	**Absent**(36)	
Gender	**Male** (159)	130 (81.8%)	29 (18.2%)	< 0.05
	Female (95)	88 (92.6%)	07 (7.4%)	< 0.05
Socioeconomic Status	**Upper** (12)	04 (33.3%)	08 (66.7%)	> 0.05
	Middle (139)	118 (84.9%)	21 (15.1%)	< 0.05
	Lower (103)	96 (93.2%)	07 (6.8%)	< 0.05

DISCUSSION

Anemia is a worldwide problem that affects people of all ages, genders, and nationalities. One-third of the world's population suffers from anemia. According to the research, "anemia is connected to increased morbidity and mortality in women and children, as well as worse birth outcomes, decreased work productivity in adults, and poor cognitive and behavioural development in children. Preschoolers and women of reproductive age are most vulnerable, although other age groups are not immune.[18, 19] In Pakistan, more over half of the population (51 percent) of women of reproductive age is anaemic, according to local literature. When compared to pregnant women, the prevalence of anemia is lower in non-pregnant women." According to Pakistan's most recent National Nutritional Survey, approximately 41.7 percent of women of reproductive age were anaemic, with a slightly greater proportion in rural (44.3 percent) than urban (40.2 percent) settings. [20, 21] It's worth noting that "in Pakistan, iron deficiency is the most frequent kind of anemia. Sindh province in Pakistan has the highest rate of iron deficiency anemia, followed by Balochistan (19.0%) and Punjab (18.7%). According to the research, 77 percent of reproductive-aged (from rural Sindh) women are anaemic, with 7.8 percent, 48.7%, and 20.8 percent classed as severely, moderately, and slightly anaemic, respectively.[22, 23] The mean age of the sample in this research stood at 34 (SD ± 5) years. Though seemingly this contradicts the literary findings which claim that the condition is more common at extremes of age and not among middle aged individuals such as in this research, however, it is important to note that the inclusion criteria of this research included a mandatory condition of being HIV positive and taking HAART. Hence the age difference is justified. [24] Research suggests that HIV is more common among sexually active men and women, and since according to the Pakistan Demographic Health Survey the mean age of marriage in Pakistan is 24, it is only likely that a pattern of age distribution such as ours may be produced, wherein the prevalence increases till middle age and then declines in the extremes of age. [25]A majority of the sample was noted to be hailing from a middle socioeconomic status and a rural background. This is synonymous with published literature that suggests high prevalence of HIV among the rural areas of Sindh. Hence most of the study participants may have hailed from such areas. [26] Anemia was found in 85.8% of the participants, with the majority of them suffering from mild to moderate anemia and only a handful suffering from severe anemia. Anemia was shown to be more common and severe in different genders, age groups, and socioeconomic levels. Elderly individuals reported a greater severity of anemia, and likewise patients from lower socioeconomic status reported a higher prevalence and greater severity of anemia. Women too suffered from severe anemia more commonly that their male counterparts. The prevalence of severity is higher than the

evidence-based values (of normal cohorts) from literature owing to the fact that the research participants were HIV infected. Similarly, when compared to cohorts of HIV positive patients (in literature), the prevalence and severity are somewhat mild. This is attributable to the fact that all patients in the sample were undergoing treatment (HAART). [27, 28] Anemia is less prevalent in individuals using HAART (7.4%), but the use of ZDV is related with anemia, according to published research from Indonesia (20.3 percent). They also found 14.3 percent of individuals with mild anemia, 1.9 percent with moderate anemia, and no patients with severe anemia. An overall anemia prevalence of 23 percent, according to an Ethiopian observational research. Anemia was related with being HAART naive, having a treatment history with anti-tuberculosis drugs, utilizing a ZDV-containing HAART regimen, and having CD4 counts < 200 cells/L in adult HIV patients.[29, 30] The total prevalence of anemia including 54 HIV patients is 23.1 percent," according to a more extensive cross-sectional study from Ethiopia, with anemia found in 16.2 percent of HAART experienced and 29.9 percent of HAART naive individuals. According to the study, 1.9 percent, 25.9%, and 72.2 percent of the total patients had severe, moderate, or mild anemia, respectively. According to their findings, the kind of HAART regimen and the length of HAART are both linked with anemia.[31] Another study found that anemia was the most prevalent cytopenia among patients on HAART follow-up, accounting for 43.1 percent (56/130). Given this context, the current study's goal was to characterise the severity and morphological aspects of anemia, as well as its predictors, among persons living with HIV/AIDS who were taking different combined first-line antiviral medications. Furthermore, this research will compare the anemia features of individuals using ZDV and TDF-containing HAART. This study will also provide additional resource for health practitioners in assessing and treating the differences in hematologic profiles of HIV-infected individuals on ZDV and TDF-containing HAART.[32]

CONCLUSION: Anemia is highly prevalent among HIV patients taking HAART therapy. Though therapy has known benefits and the prevalence of

anemia is seemingly less (than values reported in literature) than untreated patients, the difference is not much. Interesting associations can be noted among the study variable and prevalence and severity of anemia detected in the sample.

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