



FACTORS AFFECTING HEMOGLOBIN LEVEL AMONG HIV POSITIVE PATIENTS TAKING HIGHLY ACTIVE RETROVIRAL THERAPY.

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ABSTRACT

INTRODUCTION: Infection with the Human Immunodeficiency Virus (HIV) is a global public health issue. At the beginning of this century, Pakistan transitioned from a low prevalence to a high risk and subsequently to a concentrated pandemic. Among the many adverse effects of the illness, is a marked disturbance in the hematological indices, chief among which is the level of hemoglobin (Hb). In addition to the disease, other factors too may be responsible for catalyzing this change. **OBJECTIVE:** To determine factors affecting Hb level among HIV infected patients. **METHODOLOGY:** In this cross-sectional investigation, 254 HIV patients of either gender who were at least 18 years old were included in the sample. After obtaining written informed consent, information was entered onto a structured questionnaire that included questions about fundamental bio data, socio-demographic information, medical history, conclusions drawn from a general physical and systemic examination, and a baseline hematological examination. With the help of MS Excel 365 and SPSS version 21.0, the data was examined. **RESULTS:** The sample's median age was 34 years old (SD: 5). The majority of the sample was made up of middle-aged males from rural backgrounds with a middle socioeconomic position. Anemia was present in 85.8% of the sample overall, with the majority of those affected experiencing mild to moderate anemia and only a small number dealing with severe anemia. **CONCLUSION:** After careful consideration, genders, age, socioeconomic status and duration of illness were recognized as factors affecting the Hb level among HIV infected patients.

KEYWORDS: Anemia, Prevalence, Severity and HIV, Anemia, Hemoglobin Level

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INTRODUCTION

Infection with the Human Immunodeficiency Virus (HIV) is a global public health issue. The overall prevalence of HIV infection in adults aged 15 to 49 is 0.1 percent if one uses the lower figures (0.05 percent).¹ According to authorities, the majority of cases are not reported because of sex-related social taboos and victims' fears of discrimination.² The true prevalence is anticipated to be much higher because not all cases are reported and HIV is not systematically tested for in regular surveillance systems.³

After transitioning from a low prevalence, high risk HIV pandemic to a concentrated

epidemic in the early to mid-2003 period, Pakistan is currently pursuing a similar trajectory. Causes of HIV infection are high drug use & sex injection drug users. Male transvestite sex workers, female transvestite sex workers. Other groups are truck drivers, expatriated migrant workers & wires of injection drug users. It sexually transmitted disease.⁴

Among the many adverse effects of the illness, is a marked disturbance in the hematological indices, chief among which is the level of hemoglobin (Hb). In addition to the disease, other factors too may be

responsible for catalyzing this downfall. In a long-term study of drug users who are HIV positive. Physicians and other healthcare professionals frequently encounter anemia, a hematologic consequence of HIV disease, which is a progression of HIV infection evidenced by low CD4 + cell count and AIDS diagnosis. 5

Taking care of patients with this virus-induced inefficient hematopoietic, infiltrative bone marrow illness, nutritional deficits, and peripheral blood cell loss. The diversity of hematologic abnormalities reported in these patients can be attributed to splenomegaly, immunological deregulations, and medication effects. 6

The fall in Hb level is termed “anemia”, i.e., 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.7 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. 8 The etiologies of anemia include blood loss, malaria, genetic disorders, and infections, e.g., parasitic, chronic, and viral (including HIV). 9

In persons with HIV, anemia presents an additional burden and can lead to an increase in mortality and reduced quality of life 10-13 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. 14, 15 HIV infected women are highly afflicted with anemia with the prevalence ranging from 50% to 80%. 16 Risk factors of anemia in HIV include female gender, advancing HIV disease (CD4 counts<200 cells/microliter), pregnancy, injection drug-use, and co-infections with illnesses that cause anemia. 17

OBJECTIVES

To determine factors affecting hemoglobin level among HIV positive patients.

METHODOLOGY

A sample of 254 HIV patients (aged 18 and over) of either gender who had been diagnosed for at least the previous six months served as the basis for this cross-sectional investigation. Following the receipt of signed informed consent, information was entered onto a standardized questionnaire with questions about basic bio data, socio-demographic details, medical history, 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 percentage were used to express the qualitative data (No & percent). Standard deviation (X SD) and the mean were used to express quantitative data and analyzed by applying Pearson’s correlation coefficient and chi square test for assessing the association of anemia among HIV. A P value of 0.05 was considered statistically significant. SPSS 21.0 and Microsoft Excel 365 were used to analyze the data.

Inclusion exclusion criteria

Patients with HIV for at least six months. Adults with HIV who are older than 18 years old; patients with complete baseline hematological data.

Patients transferred from other healthcare facilities, people on other medications, and other exclusion criteria, pregnant women who have hematological illnesses.

RESULTS

The sample's median age was 34 years old (SD: 5), the majority of the sample was made up of middle-aged males from rural backgrounds with a middle socioeconomic position. A cumulative total of 85.8% of the sample's Hb levels were below the normal threshold, with the majority of the subjects having mild to moderate anemia and only a few having severe anemia.

TABLE 01: SUMMARY OF DESCRIPTIVE STATISTICS

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

Socioeconomic Status	Upper	12 (4.7%)	0.072
	Middle	139 (54.7%)	
	Lower	103 (40.6%)	
Residential Status	Urban	111 (43.7%)	0.066
	Rural	143 (56.3%)	
Anemia	Present	218 (85.8%)	0.029
	Absent	36 (14.2%)	
Severity of Anemia	Mild	119 (54.9%)	0.048
	Moderate	87 (39.9%)	
	Severe	12 (5.2%)	

TABLE 01: FACTORS

Variable		Anemia		P Value
		Present (218)	Absent (36)	
Age (Years)	Up to 20 (22)	20 (90.9%)	02 (9.1%)	< 0.05
	21 to 30 (57)	53 (93%)	04 (7%)	< 0.05
	31 to 40 (74)	65 (87.8%)	09 (12.2%)	< 0.05
	41 to 50 (53)	42 (79.2%)	11 (20.8%)	< 0.05
	51 to 60 (48)	38 (79.2%)	10 (20.8%)	< 0.05
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
Time elapsed since diagnosis (Years)	Less than 5	42 (36.8%)	72 (63.2%)	> 0.05
	5 or more	113 (80.7%)	27 (19.3%)	< 0.05

DISCUSSION

Anemia is a widespread health issue that affects people of different ages, genders, and geographical locations. One-third of the world's population is impacted by it. Anemia is linked to "higher morbidity and mortality in women and children, poor birth outcomes, decreased productivity in the workplace in adults, and poorer cognitive and behavioral development in children," according to the paper. Although other age groups are not exempt, preschoolers and women of childbearing age are most affected.^{18,19}

More over half (51%) of Pakistan's population of reproductive-age women, according to local literature, is anemic. When compared to pregnant women, the burden of anemia is substantially lower in non-pregnant women. According to Pakistan's most recent National Nutritional Survey, "around 41.7% of women of reproductive age were anemic, with a slightly greater proportion in rural (44.3%) as opposed to urban (40.2%) settings."^{20,21}

It is significant to remember that the most prevalent type of anemia in Pakistan is caused by iron deficiency. More precisely, Baluchistan (19.0 percent) and Punjab (18.7 percent) provinces in Pakistan have the

highest rates of iron deficiency anemia. According to recent research, "77% of reproductive-aged women in Sindh's rural areas are anemic, with 7.8%, 48.7%, and 20.8 percent being classed as seriously, moderately, and slightly anemic, 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

The bulk of the sample was found to come from rural areas and have middle socioeconomic level. This is equivalent to

published research suggesting a high prevalence of HIV in Sindh's rural districts. Therefore, the majority of the study participants may have come from these regions.²⁶ Anemia was present in 85.8% of the sample overall, with the majority of those affected experiencing mild to moderate anemia and only a small number dealing with severe anemia. Anemia was more common and more severe in some genders, age groups, and socioeconomic statuses than others. 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 than 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 likely in individuals receiving HAART (7.4%), while using ZDV is linked to anemia, according to published data from Indonesia (20.3 percent). Additionally, they identified 14.3% of patients with mild, 1.9 percent with moderate, and none with severe anemia. Anemia prevalence was found to be 23% overall in an observational research from Ethiopia. Anemia among adult HIV patients was linked to being HAART naive, having a history of anti-tuberculosis treatment, using a ZDV-containing HAART regimen, and having CD4 levels < 200 cells/L.^{29,30}

Anemia was seen in 16.2% of participants who had had HAART before and 29.9% of those who had not, according to a more in-depth cross-sectional comparison from Ethiopia that included 54 HIV patients. According to the study, out of all instances, 1.9 percent, 25.9 percent, and 72.2 percent had mild, moderate, and severe anemia, respectively. According to their findings, "HAART duration and regimen type are substantially linked with anemia."³¹

Another survey from shows that "anemia was the most common cytopenia among patients on HAART follow-up, accounting for 43.1% (56/130). Given this context, the current study set out to evaluate the severity of anemia, its predictors, as well as the

morphological characteristics among HIV/AIDS patients on various combined first-line antiviral regimens. Additionally, the features of anemia in patients on TDF-containing HAART and ZDV will be compared in this study. This study will also provide further information for medical practitioners to examine and manage the differences between the hematologic profiles of HIV-infected patients receiving HAART with ZDV and TDF.³²

CONCLUSION

After careful consideration, genders, age, socioeconomic status and duration of illness were recognized as factors affecting the Hb level among HIV infected patients.

ETHICS APPROVAL: The ERC gave ethical review approval

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin

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CONFLICT OF INTEREST: No competing interest declared.

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