A Study on Etiopathological Evaluation of Anaemia in Newly Diagnosed HIV-Infected Adults at a Tertiary Health Care Centre of Eastern India.

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Received: July 2016
Accepted: July 2016

ABSTRACT

Background: Anaemia is a common feature among HIV infected people and has been uniformly demonstrated that the severity of anaemia increase the morbidity and mortality in PLWH independent of CD4 count. There are wide variations in the prevalence of anaemia from different countries all over the world and gender specific variation observed in different studies. Aims and Objectives: Aims of our study were to study the different types and the various etiologies of anaemia in newly diagnosed HIV infected adults. Also to find out the relation between absolute CD4 counts and severity of anaemia.

Methods: Fifty newly diagnosed HIV infected adults with anaemia were included in the study. Study conducted from July 2014 to June 2015 at a tertiary care hospital and medical teaching institute in eastern India. Detailed medical history was taken, thorough physical examination was done and relevant routine laboratory investigations were done in all patients. Few special investigations were done in selected patients.

Results: In this study 70% of the patients belonged to the lower socio economic group and 58% of the cases were addicted to alcohol which is also a significant associated risk factor. The mean CD4 count was 170.1 with a standard deviation of 123.16. The mean Hb% of the population was 7.13 with a standard deviation of 1.27031492. The most common etiology found was anaemia of chronic disease (34%) and other etiologies were HIV induced myelodysplasia (32%), iron deficiency anaemia (16%), helminth infection (14%) and vitamin B12 deficiency leading to megaloblastic anaemia was seen in 4% cases. Conclusion: Anaemia of chronic disease is the most common etiology, which has correlation with disease activity.

Keywords: HIV/AIDS, Anaemia, people living with HIV/AIDS (PLWH).

INTRODUCTION

The Human Immune-deficiency Virus (HIV) is a retrovirus that infects cells of the immune system, destroying or impairing their function. It involves almost all the systems in the human body.[1] Anaemia is the commonest hematological ailment affecting HIV infected individuals at various CD4 counts and due to various etiologies.[2-3] World Health Organization defines anaemia as hemoglobin levels less than 13 g/dl for males and less than 12 g/dl for females.[3] But this definition is a generalization for all the countries, for the purposes of this study the hemoglobin cutoff values for adults are.

| Severity of anaemia | Hb in g/dl |
|---------------------|-----------|
| Mild                | 10–11.9   |
| Moderate            | 9.9–7     |
| Severe              | 6.9–4     |
| Very severe         | <4        |

The etiology of anaemia in HIV infection is multifactorial and typically the anaemia may result from low production of red blood cells, increased RBC destruction or ineffective RBC production[8] and frequently the laboratory features are compatible with anaemia of chronic disease with a low reticulocyte count, normocytic and normochromic red blood cells with normal iron stores and cytokine mediated poor erythropoietin response.[7, 8] Anaemia of chronic disease, nutritional deficiency anemias,
infections leading to anaemia and HIV induced myelodysplasia are some of the many causes of anaemia. The presentation of a patient of HIV infected individual is almost always different. Considering the seriousness of other opportunistic infections in HIV infected individuals anaemia is often not given proper attention, its cause is left undiagnosed and untreated while only hemoglobin levels are corrected.

There is a relative lack of data regarding the etiopathological evaluation of anaemia in newly diagnosed HIV-infected adults, particularly from the eastern part of India in the 1st decade of the 21st century. This study might give us an insight at the prevalence of the various etiologies of anaemia in newly diagnosed HIV-infected adults giving the clinician a chance to focus his resources on the most prevalent causes of anaemia and lead to a decrease in morbidity associated with it eventually benefiting the quality of life of the patient.

MATERIALS AND METHODS

It was an institutional based cross sectional study done by 50 consecutive newly diagnosed HIV-infected adults with anaemia who were attending outpatient department or were admitted at the Carmichael Hospital for Tropical Disease, School of Tropical Medicine, Kolkata. The exclusion criteria were those patients or parent of the patients (in case of a minor) unwilling to give consent, infants & children<18 years, pregnancy, known hemoglobinopathies like thalassemia, sickle cell anaemia and Patient suffering from medical condition known to cause anaemia like chronic kidney disease, hypothyroidism etc. Thorough history was taken and systemic examination was done. Routine laboratory investigations- complete blood counts, urine examination, stool examination and serum urea, creatinine and CD4 count were done in all patients. Few other investigations like Iron profiles (in microcytic/dimorphic type of anaemia), Vitamin B12 and folic acid assay (in macrocytosis), Direct Coombs test, bone marrow aspiration cytology studies, Chest X-Ray, USG whole abdomen etc were done in selected cases. The data’s were recorded in a predesigned case data sheet. After data collection, it was analysed by appropriate statistical software (medicalcr version 9).

RESULTS

Out of 50 patients, 68% were males and 32% were females with male: female (1.21: 1). The mean age of the population was 34 with a standard deviation of 9.94. Among male the mean age was 33.97 years with a standard deviation of 8.77 years. It was slightly higher in females (mean = 35.12 years, standard deviation = 12.02 years). However, this difference was not statistically significant (p = 0.7033 by unpaired t test).

The baseline population was mainly consisted of lower socio-economic group (70 %), followed by middle class as depicted in the Figure 1. Total 29 (58%) subjects were having addicted to either alcohol or tobacco or both as shown in the table below [Figure 2].

Regarding the educational status, 33 patients (66%) were literate. Fatigue was the most common symptom (n=41, 82%) followed by fever (n=29, 58%), weight loss (n=27, 54%), shortness of breath (n=11, 22%) etc. Pallor (n=29; 58%) was the most common sign followed by hepatomegaly (n=21; 42%), lymphadenopathy (n=8; 16%), splenomegaly (n=7; 14%).

The mean CD4 count was 170.1 with a standard deviation of 123.16. The mean Hb% of the population was 7.13 with a standard deviation of 1.27031492. All the cell lines in peripheral blood were affected which gave the following picture of different cell lines [Figure 3].
Normocytic normochromic anaemia was the predominant morphology amongst all the cases, the distribution of which is shown in the Figure 4.

The most common etiology found was anaemia of chronic disease (34%) and other etiologies were HIV induced myelodysplasia (32%), iron deficiency anaemia (16%), helmint infection (14%) and vitamin B₁₂ deficiency leading to megaloblastic anaemia was seen in 4% cases [Figure 5].

DISCUSSION

The primary aim of this study was to study the different types and the various etiologies of anaemia in newly diagnosed HIV infected adults. In our study the most common etiology found was Anaemia of chronic disease seen in 34% cases. Out of all the cases of anaemia of chronic disease no significant OI could be detected in 10% of the total cases i.e; 29.41% cases of anaemia of chronic disease [Figure 6]. The anaemia in these cases may be due to HIV itself, but this cannot be said with certainty. The next most significant etiology was HIV induced myelodysplasia seen in 32% cases. These were the patients presenting with pancytopenias and bicytopenia in peripheral blood associated with dysplastic changes in bone marrow involving all cell lines. The literature suggests the facts that MDS caused by HIV is different from primary MDS and chances of conversion to leukaemia in HIV induced MDS are very low. It is also shown that HIV induced MDS respond well to HAART. The next involved etiologies as per number of cases are Iron deficiency anaemia and helmint infection causing 16% and 14% cases each. This shows that iron deficiency anaemia is not the most common etiology as is popular belief and that stress must be given on trying to identify the proper etiology of anaemia in each individual case irrespective of the severity of anaemia. The incidence of Helmint infection seen here in HIV positive individuals is comparable to that in literature. [9] But 57% of the cases of helmint infections were actually co infections along with IDA, which points out the fact that chronic blood loss due to helmint infection might have eventually led to the development of IDA. Vitamin B₁₂ deficiency leading to megaloblastic anaemia was seen in 4% cases with a classical macrocytic picture in peripheral blood smear. There was only one case of Hemophagocytic lymphohistiocytosis proven by the diagnostic criteria as per the present literature. [10-12] Direct infiltration of bone marrow by infections was seen in 8% cases two of
Anaemia in HIV is also associated with demographic factors like socio economic status, literacy rates and addiction in the population so impetus must be given to the improvement of these parameters in the general populace.

- The most prevalent morphological variety of anaemia in HIV infected adults not on HAART is Normocytic Normochromic.
- Pancytopenia is also present along with anaemia in a significant number of cases.
- Haemoglobin levels are related to the CD4 status of the patient and are indicative of worsening of the disease.
- Anaemia of chronic disease is the most common etiology closely followed by HIV induced myelodysplasia.

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How to cite this article: Chandani R, Sarkar K, Gonjhu D, Haldar SN, De (Pati) A, Pramanik N. A Study on Etiopathological Evaluation of Anaemia in Newly Diagnosed HIV-Infected Adults at a Tertiary Health Care Centre of Eastern India. Ann. Int. Med. Den. Res. 2016; 2(5):OS01-OS05.

Source of Support: Nil, Conflict of Interest: None declared.