



HAEMATOLOGICAL CHANGES IN HIV INFECTED PATIENTS IN CORRELATION WITH CD 4 CELL COUNT.

Pathology

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ABSTRACT

HIV infection is associated with various and wide range of haematological abnormalities. Anemia, Leucopenia, Thrombocytopenia are the most commonest haematological abnormalities identified in HIV infected patients. This study was done to observe the haematological abnormalities and correlation of CD 4 cell count in HIV/AIDS infected patients. This study was done as prospective study in government villupuram medical college in 250 cases with HIV infection. Required haematological parameters and CD4 cell count were studied in all 250 cases. The most common haematological abnormality observed in this study was Anemia. The prevalence of Anemia, Leucopenia, Thrombocytopenia were 84%, 47%, 27% respectively in patients having low CD4 cell count.

KEYWORDS

HIV, AIDS, Anaemia, Leukopenia, Thrombocytopenia

INTRODUCTION

AIDS was first recognised in 1981 and HIV infection in 1983. All over the world it was viewed as pandemic and AIDS (Acquired immunodeficiency syndrome) is the most serious infectious disease among all infectious diseases. HIV infection is a major public health problem. HIV/AIDS is considered as a multisystem disease as it causes various diseases in almost all organs in our body. For assessing treatment and prognosis, haematological parameters are considered as the most important tools. Haematological changes may be due to the effect of HIV infection, secondary infection, due to therapy side effects and neoplasm. All cell lineages in bone marrow were affected by HIV infection and it is manifested as Anemia, Leucopenia and Thrombocytopenia. Correcting the haematological changes will reduce the complications and improve the quality of life.

OBJECTIVES AND AIMS:

To study haematological changes in peripheral blood of HIV infected cases. To study correlation of CD4 cell count and haematological changes in HIV positive cases.

MATERIALS AND METHODS:

This study was conducted in the department of clinical pathology, Government villupuram medical college from April 2019 to May 2019. During this period 250 HIV positive cases were identified in ART center and blood samples were collected for both complete blood cell count and CD4 cell count for all cases. Complete hemogram for all patients was done in automated hematology analyzer and it includes the following parameters: Haemoglobin, Total WBC count, Differential cell count, Haematocrit, Platelet count and RBC count.

STUDY POPULATION GROUP:

Blood samples were collected from all 250 cases in antiretroviral clinic over a period of 2 months from April 2019 to May 2019. Cases were identified as per some inclusion and exclusion criteria.

Inclusion criteria:

Age group between 20 to 60 years

Exclusion criteria:

Age less than 20 years
Age above 60 years
Not willing to participate
Pregnant lady

Finally 250 HIV infected cases (male – 175 and female – 75) were identified for this study after obtaining consent from all cases.

BLOOD COUNT:

About 2ml of venous blood collected under strict aseptic precautions in

2 EDTA (Ethylene Diamine tetra acetic acid) Vacutainers. One sample was analysed in hematology auto analyzer for complete hemogram and another sample was processed in flow cytometry for CD 4 cell counts.

RESULTS AND OBSERVATIONS:

Out of 250 HIV infected cases 88 cases were under the age group of 41-50 years. (TABLE 1),

Among the 250 HIV infected cases, 84% (210 cases) anemia, 16% (40 cases) have normal hemoglobin. Among 210 cases having anemia, 60 cases have mild anemia (10–12 g/dl), 70 cases have moderate anemia (8–10 g/dl), 80 cases have severe anemia (less than 8 g/dl). (TABLE 2)

Mostly males are affected in all types (Mild, moderate and severe) anemia. (TABLE 3).

In this study microcytic hypochromic anemia were the most common findings (95 out of 210 cases) (TABLE 4).

Out of 250 cases, 119 cases were observed as leucopenia. (TABLE 5)

50% of the total cases show CD4 count <200/mm³. (TABLE 6)

73% of the cases show normal platelet count and 27% of the cases show thrombocytopenia. (TABLE 7)

Anemia was the most common haematological abnormality observed in CD 4 count <200/mm³ (TABLE 8)

Table 1. Age wise distribution of cases

Age group in years	No. of cases	Percentage
20 – 30	36	14
31 – 40	52	21
41 – 50	88	35
51 – 60	74	30
Total	250	

Table 2. Hemoglobin distribution

Hemoglobin in g/dl	No. of cases	Percentage
10 – 12	45	21
8- 9.9	70	33
<8	95	46
Total	210	

Table 3. Sex wise distribution of hemoglobin

Haemoglobin in g/dl	Male	Female	Total
10 -12	38	7	45

8- 9.9	49	21	70
<8	63	32	95
Total	150	60	210

Table 4.Types of Anemia

Types of anemia	No.of cases	Percentage
Normocytic and normochromic	53	25
Microcytic and hypochromic	95	45
Dimorphic anemia	62	30

Table 5.Distribution of total count

Total count	No.of cases	Percentage
<4000	119	47
4001 -6000	54	22
6001 – 8000	23	9
8001 – 10000	31	12
10001 – 12000	23	9

Table 6.CD 4 cell distribution

CD4 cell count	No.of cases	Percentage
<200	127	50
201 – 499	74	30
>500	49	20

Table 7.Distribution of platelet

Platelet count	No.of cases	Percentage
>1.5 lakhs	181	73
<1.5 lakhs	69	27

Table 8.Haematological parameters and CD 4 cell count

Haematological parameters	No of cases	CD4 cell count>200	CD4 cell count <200
Anemia	210	64	146
Leucopenia	119	73	46
Thrombocytopenia	69	48	21

DISCUSSION :

Anemia was the most common haematologic abnormality observed in our study. HIV involves all cell lineages in bone marrow. Haematologic abnormalities in HIV infected cases seem to be dependent on the level of viral replication and these haematologic abnormalities are severe in last stage of acquired immunodeficiency syndrome with high level of viremia and decreased CD4 cell count. Hence it is concluded that these abnormalities worsens as the disease progresses to advanced stage(1) and correlates with the severity of HIV associated immunosuppression as measured by CD 4 cell count..(2) These haematological abnormalities are associated with increased morbidity and mortality in HIV infected patients affecting the quality of life (3).

The present study was done in order to bring out the common haematological abnormalities encountered in HIV infected patients and to correlate these abnormalities with CD4 cell count so that they can be used as prognostic marker.

ANEMIA IN HIV :

In our study anemia was identified in 210 cases (150 male and 60 female cases).The percentage of incidence was more in females when compared to male.Some cases shows dimorphic picture indicates mostly due to nutritional deficiency due to vitamin B12,folic acid and iron deficiency due to malabsorption or malnutrition(5).

LEUCOPENIA IN HIV:

Out of 250 cases, 119 cases was observed as leucopenia.Among 119 cases with leucopenia ,46 cases have CD4 cell count less than 200 cells/microliter.The major cause for leucopenia is probably due to side effect of antiviral therapy for HIV or associated condition for autoimmune mechanism involving antigranulocyte antibody and impaired granulopoiesis(6).

THROMBOCYTOPENIA IN HIV:

This study shows 69 cases with thrombocytopenia.Similarly Byomakesh Diskshit et al⁽⁷⁾ and Gul Genha de Santis et al(8) also

showed increase in the number of thrombocytopenia cases. Increased platelet destruction by deposition of circulating immune complex on platelets contributes major cause for thrombocytopenia in HIV infected cases. ⁽⁴⁾

Pancytopenia occurs in HIV infected cases particularly in advanced stage of disease ⁽⁹⁾ due to HIV affect all cell lineages in bone marrow.Multiple pathogenic mechanism including impaired haematopoiesis and immune mediated complex was considered for pancytopenia ⁽¹⁰⁾.

CONCLUSION :

HIV infection is associated with marked haematological abnormalities that complicate with health and treatment of patients.Haematological abnormalities are seen in stages of HIV infection and it serves as indicators of clinical progression and considered as monitoring tools.Change in haematological abnormalities will reduce the morbidity of HIV infected cases. Hence clinicians can utilise these basic investigations which is easily available and cost effective in all medical centers while treating the HIV infected patients.

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Authors Contribution: TRR - Concept and design of the study, collected data, statistically analyzed, reviewed the literature, manuscript preparation and critical revision of the manuscript; MD - Concept and design of the study AND critical revision of the manuscript; HG - statistically analyzed AND reviewed the literature; TA - Concept