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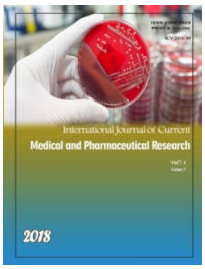

STUDY OF HAEMATOLOGICAL PROFILE IN HIV PATIENTS IN CORRELATION TO CD4 COUNT

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ABSTRACT

Introduction: HIV infection targets the immune system and decrease the CD4 count. Anaemia, granulocyte disorders and thrombocytopenia are the most common manifestation of HIV infection.
Objective: Objectives of this study was to see haematological abnormalities in HIV infected patients and correlate these with the CD4 cell counts.
Material and methods: 100 HIV positive cases were taken and were divided into Group-I, II and III according to CD4 count. Haematological profile of these cases was ascertained.
Results: Prevalence of anaemia was most common manifestation. Anaemia was present in 76%, leucopoenia 21% and thrombocytopenia in 21%. There was lymphopenia in 54% and neutropenia in 3 %. Prevalence of Anaemia, lymphopenia and thrombocytopenia increased with decrease in CD4 count.
Conclusion: Haematological Abnormalities are common in HIV infected patients. They should be investigated and treated accordingly to reduce morbidity and mortality.

INTRODUCTION

Human Immunodeficiency virus (HIV) is a lentivirus (a member of retrovirus family) that causes acquired immunodeficiency syndrome (AIDS), a condition in human in which progressive failure of the immune system allows life threatening opportunistic infections and cancers to thrive.[1, 2] HIV infects vital cells in the human immune system such as helper T-cells (especially CD4+ T cells) macrophages and dendritic cells. HIV infection leads to low levels of CD4+ cells through three main mechanisms such as direct viral killing of infected cells, increased rate of apoptosis and killing of infected CD4+ cells by CD8 cytotoxic lymphocytes that recognise infected cells.[3]

Haematological abnormalities frequently encountered in HIV infected individuals are anaemia, granulocyte disorders and thrombocytopenia. Although in the majority of cases, hematologic abnormalities are detected in middle or advanced stages of HIV infection, some of these like anaemia and thrombocytopenia have been reported to occur in early stages of HIV infection.[4] Anaemia is the most common haematological abnormality in HIV infected patients and in the absence of prognostic treatable cause, is independently associated with poor prognosis. Theaetiology of anaemia in adults with HIV infection is multifactorial and managing anaemia can involve a variety of modalities HIV infection and its direct effects on haematopoietic stem cells (HSCs) and stromal elements can lead to anaemia.[5, 6]Leucopoenia is common in HIV infected individuals.Leucopoenia typically involves both lymphocytes and granulocytes with AIDS. However a reduction in absolute no. of CD4 T cells occur as one of the immunologic abnormalities of HIV infection and the no. of these cells declines progressively over time. Platelet destruction is the prominent factor early in the course of disease while decreased platelet production is the prominent factor later in the course of disease.[7,8]

MATERIAL AND METHODS

This cross sectional study was conducted on 100 patients admitted in various wards of Department of Medicine or attending outdoor of Rajindra Hospital, Govt. Medical College Patiala in collaboration with ART centre, Rajindra Hospital Patiala to ascertain the haematological profile in HIV positive patients. Patients were divided into three Groups according to CD4 counts.

Inclusion criteria

All patients of >12 years of age and either sex proved to be HIV positive were included in the study.

Exclusion criteria

1. Age<12 years
2. Pregnant females
3. Patients on ART having Zidovudine as its constituents
4. Patients with previously known haematological disorder
5. Congenital haematological disorder.

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6. Intercurrent infections unrelated to HIV with significant effects on haematological profile.

Group 1 – CD4 count > 500 mm^3
Group 2 – CD4 count between 200-500mm^3
Group 3– CD4 count < 200mm^3

Detailed general and systematic examination were carried out with emphasis on signs like anaemia, jaundice clinically apparent bleeding manifestations, lymphadenopathy and hepatosplenomegaly. HIV status was confirmed by ELISA as well as western blot phase 4 HIV antibodies Complete haemogram (haemoglobin,MCV,MCH,MCHC,RBC count, Total leucocyte count, absolute lymphocyte count were done along with CD4 cell count.

Statistical analysis: Statistical tests used included mean standard deviation, ANOVA (Analysis of variance) Chi square test (X^2). Statistical analysing was done using SPSS version 12 P value <0,05 was considered statistically significant .

Observations

The following observations were made

Table 1 Demographic Profile of Patients

Age in years	No of cases	%age
13-30	39	39
31-50	53	53
51-70	8	8
Sex distribution	**No of cases**	**%age**
Male	77	77
Female	23	23

In the present study, the majority of patients (53%) were in age group of 31-50 years and average age came out to be 35.2±9.98 years. There were 77% males and 23% females in our study. (Table-1)

Table 2 Distribution of cases according to CD4 Groups

CD4 Group	Males	Females	Total
Group-1(>500)	21	05	26
Group-2(200-500)	16	05	21
Group-3(<200)	40	13	53

Majority of patients (53%) had CD4 count <200. (Table-2)

Table 3 Prevalence of various Haematological abnormalities in cases under study

Haematological abnormalities	No. of cases	% age
Anaemia	76	76
Leucopoenia	21	21
Lymphopenia	54	54
Thrombocytopenia	21	21
Neutropenia	03	03

Out of 100 HIV positive cases anaemia was present in 76%, leukopenia 21%,lymphopenia 54%, thrombocytopenia 21% andneutropenia 03%. (Table-3)

Table 4 Comparison of prevalence of Anaemia in different CD4 groups

CD 4 Group	No. of cases having anaemia	Total no. of cases	%age
Group-1(>500)	11	26	42
Group-2(200-500)	16	21	76
Group-3(<200)	49	53	92

Majority of patients (92%) in Group-3 had anaemia .The above table shows that prevalence of anaemia increases as CD4 count decreases which was statistically significant with *p* value of 0.000 (Table-4)

Table 5 Prevalence of different types of anaemia

Type of anaemia	No. of cases	% age
Normocytic Normochromic	49	64
Microcytic hypochromic	11	14.5
Dimorphic anaemia	16	21

In our study, out of 76 anaemic cases, 49(64%) were having normocytic normochromicanaemia,11(14.5%) had microcytic hypochromic and 16(21%) were having dimorphic anaemia as shown in Table-5.

Table 6 Prevalence of Leucopoenia in different CD4 groups

CD4 Group	No. of cases with Leucopoenia	Total no. of cases	%age
Group 1(<500)	03	26	11.5%
Group 2(200-500)	05	21	23.8%
Group 3(<200)	13	53	24.5%

As shown in Table-6, Leucopoenia was present in 21 cases. The difference in prevalence of Leucopoenia in various CD4 group was not statistically significant (P value= 0.387)

Table7 Prevalence of Lymphopenia in different CD4 groups

CD4 Group	No. of cases	Total Cases	%age
Group 1(<500)	3	26	11.5%
Group 2(200-500)	9	21	42.86%
Group 3(<500)	42	53	79.24%

Above table shows prevalence of Lymphopenia increases as CD4 count decreases which was statistically significant *p* value 0.000. (Table-7)

Table 8 Prevalence of Thrombocytopenia in different CD4 count

CD 4 Group	No. of cases	Total no. of cases	%age
Group 1(>500/mm^3)	2	26	7.6
Group 2 (200-500 /mm^3)	3	21	14
Group 3(<200/mm^3)	16	53	30

Table-8 shows prevalence of thrombocytopenia increases with decreasingCD4 count which was statistically significant *p*value =0.049

Table 9 Prevalence of Neutropenia in different CD4 count

CD4 group	No. of cases	Total cases	%age
Group 1	1	26	3.8
Group 2	1	21	4.7
Group 3	1	53	1.9

The prevalence of neutropenia in various CD4 groups as shown in Table-9, was not statistically significant

DISCUSSION

In our study, majority of patients were in the age group of 31-50 years. Mean age of all study groups was 35.2±9.98 years. Same was recorded by Parinitha *et al* (2012)[9] and Kumar R. (2016)[10]. In our study 77 were male and 23 were females. This is inconcordance with study reported by Kasthuri *et al* (2006)[11] and Prinitha *et al* (2012)[9]. In our study 76% had anaemia, 21% Leucopoenia, 54% lymphopenia, 21% thrombocytopenia and neutropenia was present in 3%.

Prevalence of anaemia was reported in 76% cases in our study which is same reported by Kumar R. (2016)[10], Tripithi *et al*

(2005)[12] and Prinitha *et al* (2012)[9]. The most common pattern of anaemia in our study was normocytic normochromic which is same reported by Kasthuri *et al* (2006)[11] and Tripathi *et al* (2005)[12.]

In our study, in relation to CD4 count in Groups 1 anaemia was present in 34.5 %, Group-2, 76% and 92% in Group 3 which is similar to reported by Kasthuri *et al*(2006) [11] and Prinitha *et al* (2012)[9]. It shows that frequency of anaemia increases as CD4 count decreases. The likely explanation for increasing frequency of anaemia with decreasing CD4 count is the opportunistic infections whose incidence increases with the decreasing CD 4 count.

In present study prevalence of leukopenia was 21%, Prinitha *et al* reported prevalence of leukopenia in 20.8%, Chandrakar *et al* (2015)[13] also reported leukopenia in 18% cases. Majority of patients with leukopenia were in Group 3 which showed incidence of leukopenia increased with decreasing CD4 count.
In our study Lymphopenia was present in 54% cases,same was reported by Kumar R. (2016)[10] and Prinitha *et al* (2012)[9].

We found thrombocytopenia in 21 %,same as reported by Prinitha *et al* (2002) [9] and Kumar R. (2016)[10]
Neutropenia was reported in 3% in present study.

CONCLUSION

Haematological manifestations are common in HIV infected patients. Anaemia is the most common manifestation. Incidence of anaemia, lymphopenia and thrombocytopenia increases with decrease inCD4 count. Patients with HIV infection should be investigated and treated for haematological abnormalities to reduce the morbidity and mortality of the patients

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