

Hematological findings in HIV Infection in Correlation to CD4 Cell Count

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Abstract: Acquired Immune Deficiency Syndrome (AIDS) is caused by lymphotropic retrovirus which was first recognised in 1981 and subsequently HIV was discovered in 1983. HIV infection causes derangement in hematopoietic system which directly results in lymphopenia with the progression of disease and leads to decrease in CD4 lymphocytes, which is directly related to prognosis of disease. It is said that other blood cells may also be deranged due to HIV infection leading to anemia, neutropenia or thrombocytopenia. The purpose of this study was to assess various haematological various haematological changes in HIV patients and to correlate the finding with CD4 counts. A total of 50 seropositive patients were studied over a period of 1 year. All patients diagnosed as HIV 1 and 2 were included in the study. Patients with no haematological study or CD4 count were excluded from the study. The hematological parameters included under this study were – Hemoglobin, Total Leucocyte count, Absolute Lymphocyte count, Platelet count, Mean Corpuscular Volume (MCV) and CD4 count. In this study 26 (52%) were male and 24 (48%) were females. Majority of cases (50%) were between the age of 30 – 44 years. Decrease in CD4 count correlated with lymphopenia with CD4 count less than 500/ μ l in majority (88%). Anemia was the commonest abnormality (62%), predominantly normocytic normochromic type. Thrombocytopenia was the least noted (14%). This study reiterated that absolute lymphocyte count is the best correlated parameter with CD4 count in seropositive patients.

Keywords: HIV, Hematological Profile, Lymphopenia, CD4 Count, Anemia.

INTRODUCTION

HIV infection and AIDS is a Pandemic disease and is known to affect hematopoietic system adversely. Hematological variations are seen at every stage of infection and significantly affect the quality of life of the patient. These changes may serve as an early indicator of disease progression in direct correlation with CD4 count.

This study was undertaken to study the various hematological changes associated with HIV seropositive patient and to correlate it with CD4 count.

MATERIALS AND METHODS

This is retrospective observational cross-sectional study done on a total of 50 HIV seropositive patients during the period of 1 year. The hematological parameters included under this study were – Hemoglobin, Total Leucocyte count, Absolute Lymphocyte count, Platelet count and MCV done on automated 5-part hematology analyser and confirmed on peripheral smear.

Flowcytometry was used for CD4 counts and correlated with hematology findings.

Patients of HIV 1 and 2 both recent and old were included in the study and their hematological profile and CD4 count done for diagnostic and therapeutic purposes were recorded. Seropositive patients with no hematological or CD4 count were excluded from the study.

RESULTS

In this present study, 52 % were males (26) and 48% were females (24). Majority of the cases were between the age group of 30 to 44 years with youngest patient being 16 years female and eldest 65 years female.

Decrease in CD4 count was correlated with lymphopenia in 48% cases (Table 1).

Majority 44 (88%) of the patients had CD4 counts <500cells/ μ l. The lowest CD4 count was less than 5 cells/ μ l and highest was 920 cells/ μ l. 34% patients (17) had CD4 counts less than 100cells/ μ l. 16% patients (8) had CD4 counts between 100cells/ μ l to 200cells/ μ l. 38% patients (19) had CD4 counts between 200cells/ μ l to 500cells/ μ l (Table 1).

Anemia was the commonest abnormality in CBC with 31 (62%) cases showing normocytic

normochromic anemia. Thrombocytopenia was only noted in 7 (14%) cases.

Table-1: CD4 counts with TLC and ALC

| CD 4 counts (cells/μl) | | <100 | 100 – 200 | 200 – 500 | >500 | Total |
|---------------------------|--------------|----------|-----------|-----------|----------|----------|
| Total Leucocyte Count | Normal Range | 13 | 05 | 15 | 01 | 34 (68%) |
| | Leucopenia | 01 | 03 | 02 | 02 | 08 (16%) |
| | Leucocytosis | 03 | 00 | 02 | 03 | 08 (16%) |
| Absolute Lymphocyte Count | Normal Range | 02 | 02 | 15 | 06 | 25 (50%) |
| | Lymphopenia | 15 | 06 | 04 | 00 | 25 (50%) |
| Total | | 17 (34%) | 08 (16%) | 19 (38%) | 06 (12%) | |

DISCUSSION

The present study showed majority of patients were between 30-44 years of age which is similar to the study done by Patwardhan *et al.*, with a male to female ration of 1.1:1 [1].

Hematological changes in HIV impair the health and treatment of patients at every stage, thus affecting the management. These changes reflect the immune status of the patients and affect the quality of life of the patients [2].

It is said that hematological disorders due to HIV infection are incompletely understood and several factors cause dysfunctional hematopoiesis in bone marrow. Some of these factors include severe nutritional stress in advanced stages of HIV infection, opportunistic infections or neoplasms invading bone marrow, other chronic diseases and the adverse effect of antiretroviral medications [3].

It is already proved that the most important biomarker to assess the prognosis is CD4 count. It is an indicator in assessing the degree of immune compromise [1].

It is found that along with lymphopenia, anemia and thrombocytopenia are common findings in our study. These parameters were severely deranged in patients having CD4 count <200 cells/μl. This was

similar to earlier study by Enawgaw *et al.*, Anemia and Pancytopenia is comparatively less prevalent in studies outside India [4].

It is said that anemia is the most frequent manifestation with majority of cases having normochromic normocytic type of anemia similar to our study [3].

Lymphopenia in our study was seen in 48% cases which is close to earlier two studies having 65% and 65.2% cases of lymphopenia respectively [1, 2]. ALC was found out to be lower with decrease in CD4 counts.

Thrombocytopenia in the present study was seen in 14% cases which is similar to the study done by Patwardhan *et al.*, and Costello C *et al.*, where it was 13% cases. Kumar *et al* had 19% cases and SS Parinitha and MH kulkarini had 18% cases of thrombocytopenia respectively [3, 1].

In the present study, majority 88% of the patients had CD4 counts <500cells/μl. Earlier studies by Enawgaw *et al.*, and Kumar *et al.*, also had having similar range of CD4 counts in 90% and 97% cases respectively [4, 1]. Above findings confirm that CD4 counts hold a close relation with haematological features in seropositive patients (Table 2).

Table-2: Comparison with other studies

| CD 4 counts (cells/μl) | Enawgaw <i>et al.</i> , | Kumar <i>et al.</i> , | Vanisr HR <i>et al.</i> , | Present Study |
|------------------------|-------------------------|-----------------------|---------------------------|---------------|
| <100 | 15.5 % | - | 25 % | 34% |
| <200 | 20.0 % | 31% | (<200) | 16% |
| 200 – 500 | 54.5 % | 67 % | 75 % | 38 % |
| >500 | 10.0 % | 03 % | (>200) | 12 % |

CONCLUSION

CD4 count being an expensive test cannot be available in majority of centres and hence absolute lymphocyte count can be used as a surrogate marker to assess the severity of disease in peripheral centres.

HIV patients should be treated for other abnormal haematological findings to increase well-being.

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