

## Evaluation of Hematological Abnormalities in HIV Patients in Kosi Zone of Bihar

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### ABSTRACT

**Background:** Hematological abnormalities are among the most common complications of HIV. Anaemia is the most common hematological abnormality in HIV patients, and is strongly associated with the progression of the disease, followed by leucopenia and thrombocytopenia. The objective of the study is to find out the magnitude & type of hematological abnormalities and its correlation to CD4 Count. **Methods:** The study was done on 80 HIV patients, above the age of 15 yrs, including both males and females, attending ART Centre, at Katihar Medical College, Katihar, Bihar. Various haematological parameters were recorded and studied with respect to CD4 count. **Results:** Among the total patients, 57.5% had anaemia, 23.75% had leucopenia and 12.5% had thrombocytopenia. The magnitude of these abnormalities were directly proportional to low CD4 counts. **Results:** Among the total patients, 57.5% had anaemia, 23.75% had leucopenia and 12.5% had thrombocytopenia. The magnitude of these abnormalities were directly proportional to low CD4 counts. **Conclusions:** These hematological parameters can be used to assess the severity and progression of HIV as they are directly associated with CD4 count. Anaemia being the single most independent factor associated with high mortality. Aggressive treatment of these haematological abnormalities can lead to substantial decline in morbidity and mortality associated with HIV patients.

**Key words:** HIV, Thrombocytopenia, Leucopenia

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### INTRODUCTION

Immune system is the main target of HIV and the most common clinicopathological feature is haematological abnormalities. Anaemia is the most common haematological abnormality followed by leucopenia and thrombocytopenia.<sup>[1]</sup> Hematological problems may be the first presentation of HIV infection, these manifestations are either caused by the virus itself or immune mechanisms, opportunistic infection, malignancies, drugs etc. Host response to HIV is mediated through cytokines and growth factors which results in impaired hematopoiesis and cytopenias which affect all cell lineages.<sup>[2]</sup>

As per 2015 annual report of NACO the total number of

people living with HIV (PLHIV) in India is estimated at 21.17 lakhs; out of which 1.51 lakhs are from Bihar. It is accompanied by a steady decline in national prevalence rate of 0.27 % in 2011 to 0.26 % in 2015.<sup>[3]</sup>

The progression of HIV depends upon the level of viral replication as these abnormalities are severe in AIDS (late stage) with increased viral load and low CD4 count.<sup>[2]</sup> The measurement of CD4 cell counts is essential to assess the immune system of HIV infected individuals as the pathogenesis of AIDS is directly related to fall in CD4

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counts. CD4 counts help to divide the patients in mild, moderate and severe category and in turn helps to guide the treatment. It also suggests patients predisposition to various opportunistic infections.<sup>[4]</sup> The combined effect of these hematological abnormalities significantly compromises patient's quality of life and leads to poor outcome to treatment.

The aim of this study is to analyze the magnitude & type of hematological abnormalities and its correlation to CD4 Count.

## METHODS

The study was done on 80 diagnosed HIV patients attending ART Centre at Katihar Medical College, Katihar, Bihar over a period of one and half year from December 2015 to May 2017.

### Inclusion Criteria:-

Patients with seropositive HIV-1, HIV-2 or both by RAPID TRI DOT METHOD

### Exclusion Criteria:-

The following groups of patients were excluded from the study:-

1. Pregnant women
2. Age < 15 years
3. Patients on chemotherapy.
4. Patients with haematological disorders like leukemias and haemoglobinopathies.

Subjects were enrolled in the study based on the inclusion and exclusion criteria. The selected subjects were briefed about the nature of the study and a written informed consent was obtained before the subject was enrolled in this study. Detailed history, general and systemic examination was conducted keeping in mind the signs suggesting hematological system involvement.

The investigations done were CBC with comment on peripheral blood smear and CD4 count by flow cytometry.

## RESULTS

A total of 80 patients were studied which including both males and females. The age of the patients ranged from 15 - 59 years. Out of these eighty, 65 (81.25%) were males and 15 (18.75%) were females.

Among the total 80 cases, anaemia (57.5%) was the most common haematological abnormality followed by leucopenia (23.75%), thrombocytopenia (12.5%) and pancytopenia (6.25%).

Table – 1 shows about half of the patients 46 (57.5%) were suffering from anaemia, followed by leucopenia (23.75%), thrombocytopenia (12.5%), and pancytopenia (6.25%).

The most common type of anaemia encountered in the study is Normocytic normochromic 19 (41.3%), followed by Microcytic hypochromic 16 (34.8%), macrocytic 4 (8.7%) and Dimorphic 7 (15.2%).

**Table 1: Showing Incidence of various haematological abnormalities (n=80)**

Haematological abnormalities	No. Of patients ( n=80 )
Anaemia	46 (57.5%)
Leucopenia	19 (23.75%)
Thrombocytopenia	10 (12.5%)
Pancytopenia	5 (6.25%)

**Table 2: Showing Types of Anaemia (n=46)**

Type of anemia	No. of patients (%)
Normocytic normochromic	19 (41.3%)
Microcytic hypochromic	16 ( 34.8%)
Macrocytic	4 (8.7%)
Dimorphic	7 (15.2%)

Table 2 shows the various types anemia encountered in the study. Normocytic Normochromic variety is the most common (41.3%), followed by Microcytic hypochromic variety (34.8%), Macrocytic anemia (8.7%) and Dimorphic variety (15.2%).

The incidence of anaemia, leucopenia and thrombocytopenia were analysed with respect to CD4 count groups. In the low CD4 count (< 200) group, the incidence of anaemia was found to be 63%, followed by leucopenia 18.75% and thrombocytopenia 10%. The high incidence of these haematological abnormalities in low CD4 count group projects about the severity of HIV as it progresses to full blown AIDS.

**Table 2: Showing Types of Anaemia (n=46)**

Parameters	CD4 counts <200	CD4 counts 200-500	CD4 counts >500
Anaemia	29 (63%)	16 (34.8%)	1 (2.2%)
Leukopenia	15 (18.75%)	4 (5%)	Nil
Thrombocytopenia	8 (10%)	2 (2.5%)	Nil

## DISCUSSION

The present study shows that these common haematological abnormalities are directly correlated to CD4 counts. As the CD4 count falls these manifestations become more severe and adversely affect the outcome of treatment in HIV patients.

In our study, majority of the patients are male 65 (81.25%) as opposed to 15 female patients (18.75%) which is similar to the findings of study done by Ranganathan et al (2004)<sup>5</sup> on 1000 HIV patients out of which 764 pts were males (77.4%) and 226 patients were females (22.6%).

Anaemia (57.5%) was the most common finding in our study, followed by leucopenia (23.75%), thrombocytopenia (12.5%), and pancytopenia (6.25%). In 2016, study conducted by Vanisri et al (2016)<sup>[6]</sup> found that 65% of patients had anaemia, followed by leucopenia in 38% and thrombocytopenia in 15% of the cases. Dikshit et al (2009)<sup>[7]</sup> also reported similar findings of anaemia in 65.5%, thrombocytopenia in 7% and pancytopenia in 6% of patients. In 2017, a study done in South Africa, by Vaughan et al

(2017)<sup>[8]</sup>, found the incidence of anaemia and thrombocytopenia to be 59.6% and 12.1% respectively.

In our study, the maximum incidence of anemia 63% is in CD4 < 200 categories, Santosh et al (2015)<sup>[9]</sup> in their study published in 2015, also found anaemia 68.75% in low CD4 <200 count group. The incidence of Hb% < 10 in our study was found to be 57.5 %, which is similar to 54.34% as found by Kathuria et al (2016)<sup>[10]</sup> in their study.

In our study, the most common morphology of anaemia was normocytic normochromic in 41.3%, followed by Microcytic Hypochromic in 34.8%, macrocytic anaemia in 8.7%. In a similar study done by Kathuria et al (2016)<sup>[10]</sup>, normocytic normochromic was seen in 57% and microcytic hypochromic anaemia in 17, as against macrocytic anaemia of 26% in this group. Pasha et al (2014)<sup>[11]</sup> also reported normocytic normochromic in 49% of the cases.

Maximum incidence of leucopenia in our study is in CD4 < 200 category 18.75%, followed by 5% in CD4 200-500 group. Our findings match with the findings of Parinitha et al (2012)<sup>[12]</sup>, who reported leucopenia in 26.8 % cases in CD4<200 and 7.4 % in CD4 count between 200 - 500. Vanisri et al (2016)<sup>[6]</sup> incidence of leucopenia as 8 % in CD4 <100.

In the study conducted by Chandrakar et al (2015)<sup>[13]</sup> shows that 21% patient had thrombocytopenia (platelet < 1 lakh/ $\mu$ l) in CD4 < 200 group, but in our study there was 10% incidence of thrombocytopenia (platelet < 1.5 lakhs/ $\mu$ l) in CD4 < 200 group, which may be due to the difference in considering the platelet count for thrombocytopenia.

## CONCLUSION

These hematological parameters can be used to assess the severity and progression of HIV as they are directly associated with CD4 count. Anaemia being the single most independent factor associated with high mortality.

Aggressive treatment of these haematological abnormalities can lead to substantial decline in morbidity and mortality

associated with HIV patients.

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