

Haematological Parameters In Visceral Leishmaniasis.

Bajaj Preeti,¹ Gosavi Shriram,² Kaur Puneet,³

¹Associate Professor, Pathology Department, Dr. Vasantrao Pawar Medical College, Hospital & Research Centre, Nashik, Maharashtra (India)

²Assistant Professor, Community Medicine Department, Dr. Vasantrao Pawar Medical College, Hospital & Research Centre, Nashik, Maharashtra (India)

³Assistant Professor, Gian Sagar Medical College & Hospital, Banur, Rajpura.

ABSTRACT: Context: Visceral Leishmaniasis (VL) is a chronic infectious disease caused by parasites of the *Leishmania donovani* complex, also known as Kala Azar. It is an endemic disease in the Indian subcontinent, mainly seen in the states of Bihar and West Bengal. VL can cause a variety of haematological disorders like anaemia, leucopenia, thrombocytopenia and pancytopenia. Myelofibrosis, Myelodysplasia and hemophagocytosis can be seen in the bone marrow. **Objective:** To study the haematological parameters in visceral leishmaniasis. **Material & methods:** The study included retrospective analysis of 30 patients diagnosed as having leishmaniasis on bone marrow aspirate smears. The haematological parameters – haemoglobin, total leucocyte count and platelet count were studied. Statistical analysis was done. **Results:** The mean age of patients was 35.4 with standard deviation of 16.3 with male:female ratio 1.5:1. Haematological parameters studied showed mean haemoglobin (Hb) of 6 ± 1.3 gm/dl. (Range 5-7.1gm/dl). Leucopenia was present in 25 patients. Total Leucocyte count (TLC) was $3.6 \pm 2.4 \times 10^9/L$ (Range 2.3-3.6 $\times 10^9/L$). Thrombocytopenia was seen in 22 patients & mean platelet count was $88.7 \pm 62.2 \times 10^9/L$ (Range 43-152 $\times 10^9/L$). Pancytopenia was noted in 20 patients. **Conclusions:** In this study we found that, anaemia, leucopenia and thrombocytopenia were present in the bone marrow aspirates of the VL patient.

KEYWORDS: Visceral, Leishmaniasis, haematological, parameters,

1. INTRODUCTION

Leishmaniasis (VL) also known as Kala-azar and black fever, is the most severe form of leishmaniasis. This disease is caused by *Leishmania donovani*, a protozoa transmitted by the bite of sandfly, *Phlebotomus*.¹ Leishmaniasis is a protozoan parasitic infestation, associated with three main types of disease patterns: Visceral, cutaneous and mucocutaneous leishmaniasis. Various haematological manifestations are found in visceral forms. Visceral Leishmaniasis (VL) may present to the haematologist as splenomegaly, hepatomegaly, fever, lymphadenopathy or pancytopenia.² VL is a chronic illness characterized by irregular fever, hepatosplenomegaly and pancytopenia, progressive weakness and emaciation which can result in death if left untreated.³ More than 90% of the world's VL cases is from the Indian subcontinent. 90 percent of all these cases are reported from the states of Bihar, West Bengal and Uttar Pradesh alone.⁴ Confirmation of diagnosis is made by demonstration of the parasite by microscopic examination of material obtained by bone marrow aspiration biopsy or rarely splenic aspirates. The parasites are found intracellular in the reticuloendothelial system as the amastigote form which is aflagellate, round and two to four μm in diameter, known as the Leishman Donovan (LD) body.³

We aim to retrospectively study the haematological parameters in visceral leishmaniasis.

2. MATERIAL & METHODS

This cross-sectional study was conducted in Pathology Department, at Dayanand Medical College & Hospital, Ludhiana. The study was conducted from July 2009 to June 2011. The retrospective analysis was done on 30 patients diagnosed as visceral leishmaniasis/ Kala azar on bone marrow aspirate smears. The haematological parameters which included haemoglobin (Hb), total leucocyte count (TLC) and platelet count were studied. Statistical analysis was done using Epi_info 6.04d software package.

3. RESULTS

In this study the mean age of patients was 35.4 with standard deviation of 16.3 & 18 Patients were male and 12 patients were female with male:female ratio was 1.5:1. Distribution of study subject by age & sex was shown in Table 1.

Pancytopenia was noted in 20 patients & almost all of the patients have moderate to severe grade of anaemia. Various haematological parameters including haemoglobin (Hb), Total Leucocyte count (TLC), platelet count etc have been detailed in table 2.

Table 1: Distribution of study subject by age & sex

Age	Female	Male	TOTAL
Less than 30 years	4 (33.3)	10 (55.6)	14 (46.7)
More than 30 years	8 (66.7)	8 (44.4)	16 (53.3)
TOTAL	12 (40.0)	18 (60.0)	30 (100.0)

Figures in parenthesis are percentages.

Table 2: Haematological parameter in VL patients.

Haematological parameter (n=30)	Mean (SD)	Range
Hb (gm/dl)	6 ± 1.3	5-7.1
PLATELET (x10 ⁹ /L)	88.7 ± 62.2	43-152
TLC (x10 ⁹ /L)	3.6 ± 2.4	2.3-3.6

4. DISCUSSION

In our study, almost all the 30 patients with VL were anaemic & mean haemoglobin (Hb) was 6 ± 1.3 gm/dl. Similarly as per Al- Jurrayan et al. found that all patients were anaemic in the study of 94 patients with VL.⁵ Marwaha et al reviewed 23 patients with VL and found that all patients were moderately to severely anaemic.⁶ Dhingra et al. reported anaemia in 17 cases out of a total of 18 patients suffering from VL.³ In our study, 25 patients were leucopenic & mean TLC was 3.6 ± 2.4 x10⁹/L. Similar finding reported in the various studies on VL patients i.e. 2.8 X 10⁹/L, 4x10⁹/L & 2.4x 10⁹/L by Cartwright et al. Aikat BK et al. & Marwaha et al. Respectively.^{7,8,6} In our study, thrombocytopenia was seen in 22 patients & mean platelet count was 88.7± 62.2 x 10⁹/L. Dhingra et al. reported thrombocytopenia in 11 out of 18 cases with a mean platelet count of 84 x 10⁹/L.³ Dube et al. reported thrombocytopenia in 92% patients.⁹ Pancytopenia was seen in 20 patients (66.6%) in our study. Dhingra et al. also reported pancytopenia in the form of anaemia, leucopenia and thrombocytopenia as the most common haematological finding.³ Varying degree of frequency and severity of pancytopenia has been reported by several group of workers.^{10,11} Pancytopenia is usually seen after prolonged duration of illness.

The cause of anaemia seen in patients is multifactorial: sequestration and destruction of red blood cells (RBC) in enlarged spleen, immune mechanism and alterations in RBC membrane permeability have been implicated. Leucopenia is an early and striking manifestation of VL. The main cause of the development of leucopenia has been attributed to hypersplenism. Platelet counts are usually affected after long duration of illness. Splenic sequestration is possibly the main contributory factor and immune mechanisms are believed to be non-contributory as anti-platelet antibodies have not been recorded in any study on VL. Profound involvement of the haematological system in the form of bone marrow and peripheral blood changes are consistently seen in VL. Pancytopenia occurs because of splenic sequestration of blood cells.²

5. CONCLUSION

In our study haemoglobin, total leucocyte count and platelet count were the haematological parameters studied. In this study we found that, haematological abnormalities in VL are common. Anaemia, leucopenia and thrombocytopenia are quite frequently associated with visceral leishmaniasis. In patients with endemic areas, the deranged haematological parameters and the clinical presentation need to warn the pathologist as well as clinicians regarding the possibility of Leishmaniasis.

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