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## A study of red blood cell abnormalities in chronic liver disease

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### Abstract

In foetal life the liver and spleen are the most important sites of RBC production. Though majority of this function will be transferred to marrow, the nutrients needed for the formation will be dealt in liver itself. The metabolism of heme also occurs in liver up to some extent. So, chronic liver disease is always associated with some red blood disorder. As there are limited number of studies that have been reported in this field this study is one such noble attempt.

**Keywords:** RBC, cell, abnormality, chronic liver disease

### Introduction

Anemia of diverse etiology occurs in about 75% of patients with chronic liver disease<sup>[1]</sup>. In foetal life the liver and spleen are the most important sites of RBC production. Though majority of this function will be transferred to marrow, the nutrients needed for the formation will be dealt in liver itself. The metabolism also heme also occurs in liver up to some extent. Chronic disease process of the liver involves a process of progressive destruction and regeneration of the liver parenchyma leading to fibrosis and cirrhosis<sup>[2]</sup>. Numerous hematologic manifestations of cirrhosis are present, including anaemia from a variety of causes including hypersplenism<sup>[3]</sup>, haemolysis, iron deficiency, and perhaps folate deficiency<sup>[4]</sup> from malnutrition. According to studies by Kimber C, Deller DJ and Lander H.<sup>[6]</sup> the mechanism of anaemia in CLD 1965 and Sheehy W and Berman A<sup>[7]</sup>, the anaemia of cirrhosis, anaemia occurs in up to 75% of patients with chronic liver disease. It is characteristically of moderate severity and is either normochromic normocytic<sup>[8, 9]</sup> or moderately macrocytic. So, chronic liver disease is always associated with some red blood disorder. As there are limited number of studies that have been reported in this field this study is one such noble attempt.

### Aims and Objectives

To study the Red blood cell abnormalities in chronic liver disease.

### Materials and Methods

This study was done in the Department of Medicine, Kasturba Medical College, Mangalore.

This study was done from June 2018 to May 2020.

This study was done in 60 patients who were confirmed to have chronic liver disease.

This is a descriptive study and was done in confirmed patients after taking their consent.

### Inclusion Criteria

- Confirmed cases of chronic liver disease.
- Alcoholic, infections of liver and metabolic disorders of liver.

### Exclusion Criteria

- Other haematological disorders
- Carcinomas of liver.

After detailed physical examination the blood was collected and sent for RBC count, Haemoglobin estimation, packed cell volume (PCV), Mean Corpuscular Volume, Mean Corpuscular Haemoglobin Concentration, Mean Corpuscular Haemoglobin was estimated by auto analyser. Peripheral smear for blood picture by wedge slide method. Using stains, blood picture is examined with a microscope.

Reticulocyte count was done using 1% brilliant cresol blue stain.

**Results**

**Table 1:** Sex Distribution

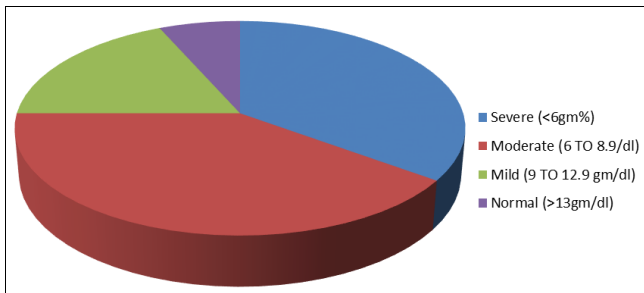
Males	Females
52	08

**Table 2:** Mean age of the population

Total	Mean age	Std deviation
60	39.72 years	±9.47 years

**Table 3:** Haemoglobin Chart

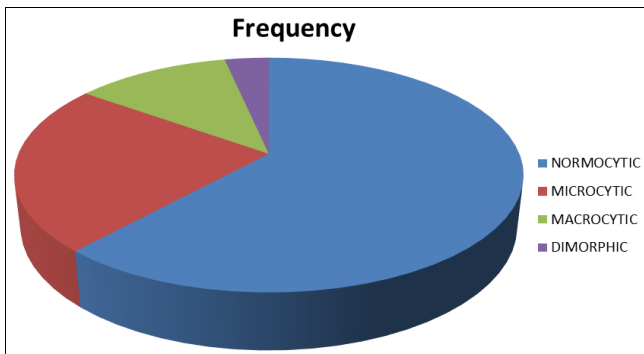
Severity	Frequency
Severe (<6gm %)	21
Moderate (6 TO 8.9/dl)	24
Mild (9 TO 12.9 gm/dl)	11
Normal (>13gm/dl)	04



**Graph 1:** Haemoglobin Chart

**Table 4:** RBC Description

Type	Frequency
Normocytic	37
Microcytic	14
Macrocytic	07
Dimorphic	02



**Graph 2:** RBC Description

Five patients with microcytic anemia showed anisocytosis and poikilocytosis. Target cells were seen in only two patient. Acanthocytes was not seen in any of the peripheral smears.

**Discussion**

Decreased erythropoietin level as per a study (10) was reported in cirrhosis patients with anaemia when compared with patients with chronic anaemia due to iron deficiency. Cirrhosis without anaemia is not associated with low

erythropoietin levels [11]. Chronic inflammation in cirrhosis leads to increased levels of serum inflammatory cytokines which suppress the bone marrow [12]. According to a study [13] most common anaemia seen in cirrhotic patients is normochromic and normocytic anaemia. Serum iron is bound to P globulin transferrin and total iron binding capacity largely depends on transferrin concentration. The TIBC is often lowered in cirrhosis due to reduced hepatic synthesis of transferrin. Target cells and also thin macrocytes are found in cholestatic jaundice and hepato cellular jaundice. They have increased resistance to osmotic lysis. They are particularly prominent in cholestasis where a rise in bile acids may contribute by inhibiting lecithin cholesterol acyl transferase (LCAT) activity [14, 15] which was proved by the study conducted the same author. Spur cells or acanthocytes which are associated with advanced liver disease, are bad prognostic sign [16]. They are not found in our study groups. They form because of an interaction with the abnormal HDL found in Liver [17].

**Conclusion**

This study is intended to be helpful for the practising physicians. This part has to be kept in mind and there after treated accordingly.

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