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Haematological Profile in Chronic Liver Disease Patients in Geriatric Population: An Observational Study

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ABSTRACT

Background: The incidence of chronic liver disease is increasing worldwide. Common causes of chronic liver disease include alcohol, chronic hepatitis B and C and non-alcoholic fatty liver disease (NAFLD). Abnormalities in hematological parameters are common in patients with cirrhosis. There is paucity of data in geriatric population with chronic liver diseases.

Methods: A pre-structured performa was prepared to collect the demographic data that included Age, Gender, Occupation, Area of Residence, History of present illness (duration of illness, bleeding tendencies, abdominal distension, jaundice, oliguria). Peripheral blood smears were assessed for Anisopoikilocytosis, nucleated RBCs and morphological type of anaemia; Hypersegmented neutrophils, toxic granulation, relative lymphocytosis and immature cells/ blasts and platelet number and morphology.

Conclusion: The study categorically showed male preponderance in patients with Chronic Liver disease. Anaemia was prevalent in 89% of study population with major blood picture being normocytic normochromic anaemia. Mild to moderate thrombocytopenia was seen in 17% and leucopenia was seen in 32% of the patients.

Keywords: Chronic liver disease, Haematological profile, Geriatric

INTRODUCTION

The incidence of chronic liver disease is increasing worldwide.[1] Common causes of chronic liver disease include alcohol, chronic hepatitis B and C and non-alcoholic fatty liver disease (NAFLD). Liver has a major impact on the production and maintenance of blood starting early in life in the foetus. It functions as a haemopoietic organ before birth and plays an active and vital role in proper erythropoiesis and the manufacture of clotting factors and inhibitors after birth, as well as maintaining hemostasis balance. The liver also stores iron, Vitamin B12, and folic acid, all of which are required for normal hematopoiesis.[2]

Abnormalities in hematological parameters are common in patients with cirrhosis. Due to its unique portal circulation and synthetic properties (clotting factors, thrombopoietin) and immune functions, the liver is involved in or responsible for a variety of haematological abnormalities.

The pathogenesis of abnormal hematological indices in cirrhosis is multifactorial and includes portal hypertension-induced

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sequestration, alterations in bone marrow stimulating factors, viral and toxin-induced bone marrow suppression. The factors affecting are dietary deficiencies, bleeding, alcoholism, and abnormalities in hepatic protein synthesis for blood formation or coagulation. Abnormalities in these hematological indices are associated with an increased risk of complications including bleeding and infection.[3]

There is a paucity of data from Indian subcontinent regarding the blood picture in patients of CLD. Keeping this in mind the present study was undertaken which to help clinicians and epidemiologists in decision making.

MATERIAL AND METHODS

After obtaining the due approval of the Institutional Ethics Committee patents were enrolled after taking a written informed consent from them.

Study design: Hospital Based Cross Sectional study

Study period: Duration of 2 years ie, from August 2019 to July 2021

Study Population: All patients more than 60 years admitted in hospital for evaluation of chronic liver disease.

Sample Size: 100

The prevalence of haematological abnormalities in cases of CLD is approx. 80% (1). Sample size was calculated using formula:

$$n = Z^2_{\alpha} (5\%)\ p\ (1\text{-}p) / E^2$$

n=sample size

Z = Level of significance (at 95% confidence level, its value is 1.96)

P = probability (0.80)

Q = 1-P (1-0.80=0.20)

E= Error (10% of prevalence)^2

$$n = (1.96)^2 * (0.80) * (0.20) / (0.08)^2$$

n =97=100 (approx.)

Inclusion Criteria

1. All patients more than 60 years with chronic liver disease-Alcoholic cirrhosis, viral cirrhosis, autoimmune hepatitis, metabolic causes of liver diseases.
2. Ultrasonography finding of small nodular liver with splenomegaly and intra-abdominal collaterals or presence of ascites

Exclusion Criteria

1. Patients with underlying malignancy or known primary hepatocellular carcinoma.
2. Patients with primary coagulation disorder or primary abnormalities of haemostatic function.
3. Acute hepatic failure.
4. Patients with pre-existing anaemia due to other causes.
5. Patients suffering from end stage medical diseases like COPD, Coronary artery disease, cardiac failure and CKD.

STUDY METHODOLOGY

A pre-structured performa was prepared to collect the demographic data that included Age, Gender, Occupation, Area of Residence, History of present illness (duration of illness, bleeding tendencies, abdominal distension, jaundice, oliguria). Past history was taken regarding previous treatment of diabetes, hypertension, tuberculosis, coronary heart disease, trauma, blood transfusion, surgery needle pricks, contact with blood products. Personal history was recorded regarding alcoholism (years, types and grams of alcohol consumption was asked in detail), smoking along with family history of chronic liver diseases, HTN, DM.

Blood samples were obtained and analysed for Complete Blood Count(CBC) and routine clinical biochemistry. Peripheral blood smears were assessed for Anisopoikilocytosis, nucleated RBCs and morphological type of anaemia; Hypersegmented neutrophils, toxic granulation, relative lymphocytosis and immature cells/ blasts and platelet number and morphology.

STATISTICAL ANALYSIS

The collected data was analysed using SPSS (Statistical Package for social sciences) version 25.0 software. For Qualitative data various rates, ratios and percentages (%) were estimated where as for quantitative data Mean/Median, SD etc. were calculated. Categorical and nominal data was analysed and expressed in percentage. The T-test was used for analysing quantitative data, or else non parametric data was analysed by Mann Whiteny test and categorical data. P-value < 0.05 considered as significant.

RESULTS

Table 1

SYMPTOMS	Present
Generalized weakness	94
Dyspnea	40
Abdominal distension	88
Hematemesis /melaena	26
Abdominal pain	09
Encephalopathy	12
Pallor	53
Icterus	51
Loss of body hair	6
Koilonychia	4

Distribution of cases as per clinical presentation

Table 2

Past history	No. of cases
Alcoholic Liver Disease	68
Hepatitis C Virus	04
Hepatitis B Virus	13
Autoimmune hepatitis	06
Primary Biliary Cholangitis	02
Wilsons disease	01
Budd chari syndrome	01
Glycogen storage disease	01
Cryptogenic causes	04

Distribution of cases based on etiology of liver disease

Table 3

Grade	Platelet count	No. of cases	%
Severe thrombocytopenia	< 20000	8	8%
Moderate thrombocytopenia	20000-70000	9	9%
Mild thrombocytopenia	70000-150000	34	34%
Normal	>150000	49	49%
Total		100	100

Distribution of study subjects based on platelet count

DISCUSSION

In the present study 70% of males and 95% of females had anaemia. Majority of males(48.5%) and females(47.5%) had moderate anaemia, 31.5% of male an 42% of female had severe anaemia, 20% of male and 10.5% of female had mild anaemia.

In the study done by Bibhu Prasad Behera,[4] among 69 patients, showed a mean Hb of 7.99±2.18 g/dl, of which 53.62% of patients had severe anaemia, 36.23% patients had moderate anaemia, 5.8% of them had mild anaemia and 4.35% of them had a haemoglobin in normal range. In study done by Sudhir Chandra Jha [5] among 50 patients 88% of patients were anaemic out of which 45.5% of male and 50% of female patients had moderate anaemia, and 22.7% of male and 33.3% of female patients were severely anaemic. In Selvamani et al[6] among 100 patients 88% patients had anaemia and only twelve patients had normal hemoglobin. About 32% patients had severe anaemia less than 8gm% of hemoglobin. In study done by Viney Sambyal[7] et al among 546 patients 43.2% patients had haemoglobin less than 9gm%.

RBC Morphology

In present study 11 patients with normal haemoglobin level had normochromic and normocytic blood picture. Majority of the males(54%) and females(42%) with anaemia had a normocytic and normochromic blood

picture. 27% of male and 26% of female patients with anaemia had a microcytic hypochromic blood picture. 15% of male and 21% of female patients with anaemia had macrocytic normochromic blood picture. 4% of male and 1% of female patient with anaemia had a dimorphic blood picture.

In Selvamani et al study among the 100 patients 52% patients had normochromic and normocytic anaemia, 30% patients had microcytic anaemia and 16% patients had macrocytosis,02% patients had dimorphic anaemia. In study done by Gaurav Bhutada et al among 30 patients of chronic liver disease 26.66% patient had a normal blood picture, 36.66% had microcytic blood picture and 36.6 % had microcytic blood picture. In Bibhu Prasad Behera et al study among 69 patients, majority of 60.87% had microcytic hypochromic blood picture, 36.26% had a normocytic normochromic blood picture.

WBC Abnormalities

In the present study, WBC count of less than 4000 was seen in 32% cases and WBC of 60% patients were with in normal range (4000-11000), and 8% of patients had a raised WBC count.

In study done by Selvamani et al among the 100 patients leucopenia was present in 6% of patients and leucocytosis in 22% of patients. In study done by Viney Sambyal et al among 546 patients 7.7% had leucopenia, and 3.3% had leucocytosis.

Platelet Abnormalities

In the present study 49% cases had a normal platelet value of >1 .5 lakh /cumm and 51% had thrombocytopenia. Majority of cases that is 34% had mild thrombocytopenia (70000-1.5 Lakh/cumm). 9% cases had moderate Thrombocytopenia (20000- 70000/cumm) and 8% cases had severe thrombocytopenia (< 20000 /cumm).

In study done by Selvamani et al Thrombocytopenia was found in 46 patients among 100 cases in the study. In study done by Viney Sambyal et al among 546 patients 48.7% patients had thrombocytopenia. In study done by Bibhu Prasad Behera et al 68.12 patients had thrombocytopenia.

CONCLUSION

The study categorically showed male preponderance in patients with Chronic Liver disease. Anaemia was prevalent in 89% of study population with major blood picture being normocytic normochromic anaemia. Mild to moderate thrombocytopenia was seen in 17% and leucopenia was seen in 32% of the patients. Similar studies at other centres will help to create a data base of haematological profile in CLD patients in geriatric population of India.

CONFLICT OF INTEREST: None

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