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A STUDY ON HAEMATOLOGICAL AND HEMOSTATIC ABNORMALITIES IN PATIENTS WITH CHRONIC LIVER DISEASE.

General Medicine

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ABSTRACT

The Liver is the largest organ of the body. It plays a crucial role in maintaining hemostasis and keeping the hematological parameters within normal limits. Hematological abnormalities in patients with cirrhosis of the liver increase morbidity and mortality to the underlying illness. Consequently, it is vital to look into those abnormalities in a patient with liver disease. The purpose of the study was to determine the hematological and hemopoietic abnormalities in decompensated chronic liver disease patients to guide treatment decisions toward reducing mortality and morbidity. **Objectives:** To assess RBC; WBC; platelet abnormalities and the derangement of clotting factor secretion and function in patients of chronic liver disease; To know the type of anemia in patients with chronic liver disease. **Materials And Methods:** A Cross-Sectional Observational Study was carried out at Narayana Medical College and Hospital for a duration of 18 months from February 2021 to October 2022, about 70 patients were randomly selected among inpatients **Inclusion Criteria:** All the patients with signs and symptoms of liver disease for more than 6 months of any etiology. **Exclusion Criteria:** Patients with Acute hepatic failure; Known case of any malignancy and with primary abnormalities in hemostatic functions; Patients suffering from chronic kidney disease, and coronary artery disease. Patients with a preexisting cause of anemia other than liver disease. **Results:** Most common type of anemia is Normocytic normochromic anemia. Leucopenia is less common than leukocytosis. Most of the patients had Thrombocytopenia, Prolonged PT, and APTT. **Conclusion:** From this study, we conclude that hematological alterations are very common in a patient with liver disease which needs to be identified and corrected early for a better clinical outcome.

KEYWORDS

Chronic Liver Disease, Hematological Abnormalities, Hemopoietic Derangements.

INTRODUCTION:

The liver is the largest organ of the body accounting for 1.5-2.5% of lean body mass and it is about 1000-1500grams of the whole body weight. It is one of the most complex functioning organs in the body. During fetal life, the liver is the primary site for hematopoiesis and plays a crucial role in maintaining blood hemostasis and hematological parameters in postnatal life. It is a major site of storage for iron, vitamin B12, and folic acid and the synthesis and secretion of several clotting factors and inhibitors. Hence, liver diseases are always associated with a wide range of hematological abnormalities.

Progressive deterioration of liver function for more than six months is termed a chronic liver disease that can be due to various etiologies. As a result, there will be - Decreased synthesis of proteins, carbohydrates, lipids, clotting factors, and inhibitors; Impaired storage of iron, vitamin B12, and folic acid; Impaired detoxification of toxic products of metabolism and various drugs thus resulting in several clinical manifestations.

Several studies have proven that hematological and hemopoietic abnormalities add morbidity and mortality to a patient with liver disease. This study was done at Narayana medical college and hospital; Nellore to assess the prevalence of various hematological abnormalities including RBCS, WBCS, Platelets, the incidence and type of anemia, hemopoietic derangements by measuring prothrombin time(PT), activated partial thromboplastin time (APTT) in decompensated chronic liver disease patients. Thus identifying the abnormalities early and treating them may help the patient with liver disease for a better outcome.

AIMS AND OBJECTIVES:

1. To assess RBC; WBC; platelet abnormalities in patients with chronic liver disease.
2. To know the type of anemia in patients with chronic liver disease.
3. To assess the derangement of clotting factor secretion and function in patients with chronic liver disease.

MATERIALS AND METHODS:

A cross-sectional observational study was conducted at Narayana medical college and Hospital; Nellore from February 2021 to October 2022. About 70 cases were admitted in the wards of general medicine and medical gastroenterology satisfying inclusion and exclusion criteria selected as study subjects.

Oral consent and written consent if needed were taken from all the patients for clinical examination as well as to evaluate for chronic liver disease and hematological abnormalities. A thorough history regarding the presenting complaints including the duration of illness, jaundice, abdominal distension, chronic fatigue, generalized weakness, and bleeding tendencies like hematemesis and melena was taken. Also got the history regarding the presence of other comorbidities including coronary artery disease, chronic kidney disease, tuberculosis, systemic hypertension, diabetes mellitus, and personal history of high-risk behavior intravenous drug abuse, alcoholism, history of liver disease among family members. Later the patient was subjected to several investigations.

Investigations Done:

1. Complete blood picture
2. Peripheral smear
3. Liver function tests
4. Prothrombin time
5. Activated Partial Thromboplastin time
6. Liver biopsy
7. Upper GI endoscopy
8. USG abdomen / CT abdomen

Inclusion Criteria:

All the patients with signs and symptoms of liver disease for more than 6 months of any etiology.

Exclusion Criteria:

1. Patients with Acute hepatic failure.
2. Known case of any malignancy including primary hepatocellular carcinoma.
3. Known case of primary abnormalities in hemostatic functions.
4. Patients suffering from chronic kidney disease, and coronary artery disease.
5. Patients with a preexisting cause of anemia other than liver disease.

RESULTS:

Blood investigations were done for 70 patients with decompensated chronic liver disease at Narayana Medical College and Hospital.

Out of 70 patients, 61 are male and 9 are female

Table 1 – Sex Distribution of Patients

GENDER	NUMBER	PERCENTAGE (%)
MALE	61	87.14
FEMALE	9	12.85
TOTAL	70	100

Table 2- Age Distribution of Patients:

AGE IN YEARS	MALE	FEMALE	TOTAL	PERCENTAGE (%)
20-30	3	0	3	4.28
31-40	16	1	17	24.28
41-50	36	6	42	60
51-60	6	2	8	11.42

Table 3- Haemoglobin Values of Patients:

Hemoglobin (g/dl)	Male In Number	Male In Percentage (%)	Female In Number	Female In Percentage (%)
SEVERE (<6 g/dl)	16	26.22	3	33.33
MODERATE (6 – 8.9 g/dl)	33	54.09	5	55.55
MILD (9 – 12.9 g/dl)	7	11.47	1	11.11
NORMAL (>=13 g/dl)	5	8.19	0	0

Table 4- Types of Anaemia:

RBC Morphology	Number of MALES	Percentage of MALES (%)	Number of FEMALES	Percentage of FEMALES (%)
NORMOCYTIC	34	55.73	4	44.4
MICROCYTIC	17	27.86	3	33.3
MACROCYTIC	8	13.11	2	22.2
DIMORPHIC	2	3.27	0	0

Table 5 –Total Leucocyte Count:

WBC'S	Total Number of Patients	Percentage (%)
LEUCOPENIA < 4000 Per cu.mm	35	51
NORMAL RANGE 4000 – 11,000 Per cu.mm	10	13
LEUCOCYTOSIS > 11,000 Per cu. mm	26	36

Table6- Platelet Count:

Platelet Count	Number Of Cases	Percentage (%)
> 1,50,000 per cu.mm	35	51
1,00,000 – 1,50,000 percu.mm	10	13
< 1,00,000 per cu.mm	26	36

Tables 7 And 8 - Coagulation Abnormalities:
Table 7

Prothrombin Time (PT)	Number Of Cases	Percentage (%)
Normal (9 – 12 seconds)	11	15.71
Prolonged	59	84.28

Table 8

Activated Partia Thromboplastin Time (APTT)	Number Of Cases	Percentage (%)
Normal (26- 36 seconds)	7	10
Prolonged	63	90

DISCUSSION:

This study conducted at Narayana Medical College and Hospital on 70 patients has thrown light on many of the hematological abnormalities that are seen in chronic liver disease. In this study, out of 70 patients, 61 are male and 9 are female with the age ranging from 20 to 80 years .60 % of the patients were between the age group of 41- 50 years.

92.8% of patients were anemic and out of which 27.14 % were severely anemic with hemoglobin <6 g/dl. A study by Rosario Gonzale Z – et al showed that anemia in CLD patients was 75%. In our study most common anemia observed was normocytic normochromic (54.2%), 14.2% had macrocytic, 28.5% had microcytic and 2.8% had dimorphic anemia. A similar result was in the study conducted by Qamar[4] et al wherein, among 213 subjects, anemia was present in 126 subjects during the study, among which 37% had it at baseline, whereas 63% developed it during the study. The most common anemia seen in cirrhotic patients is normochromic and normocytic anemia which is due to bone marrow suppression, hypersplenism, hemodilution, and macrocytic anemia in alcoholic CLD patients due to folic acid and vitamin B12 deficiency and microcytic anemia in patients with bleeding from various sites.

The total leucocyte count in 8 % of the patients was less than 4000 cells/cumm i.e leucopenia which can be due to bone marrow suppression by chronic inflammation, hypersplenism, infection, alcohol toxicity, and normal counts (4000 – 11000 cells per cumm) were present in 52 % of the patients and leukocytosis in 40% of the patients due to spontaneous bacterial peritonitis, nosocomial infections.

49% of patients were having thrombocytopenia (< 1,50,000 per cumm). The result is similar to the study conducted by Qamar et al[4], which studied that most subjects had thrombocytopenia. The causes of thrombocytopenia are hypersplenism, folate deficiency, bone marrow suppression, sepsis, disseminated intravascular coagulation, and low thrombopoietin levels.

In our study, 84.2% of patients had prolonged PT, and 90% of patients had prolonged APTT. As the liver secretes all clotting factors except VIII &VWB factors. A deranged coagulation system is universal in chronic liver disease.

CONCLUSION:

Many conclusive results regarding the hematological abnormalities and hemopoietic derangements in decompensated chronic liver disease were obtained with this limited study involving 70 patients with chronic liver disease.

- The most common type of anemia in both males and females is Normocytic normochromic anemia
- Leucopenia is less common than leukocytosis
- Nearly half of the patients had Thrombocytopenia
- Most of the patients had prolonged PT and APTT

From this study, we conclude that hematological alterations are very common in a patient with liver disease, which needs to be identified and corrected early for a better clinical outcome by reducing morbidity and mortality.

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