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SPECTRUM OF HAEMATOLOGICAL ABNORMALITIES IN DECOMPENSATED CHRONIC LIVER DISEASE AT A TERTIORY CARE CENTER : CROSS SECTIONAL STUDY

General Medicine

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ABSTRACT

Background: Chronic liver disease (CLD) is frequently associated with hematological and hemostatic abnormalities resulting from hepatocellular dysfunction, portal hypertension, hypersplenism, nutritional deficiencies, and impaired synthesis of coagulation factors. These abnormalities contribute significantly to morbidity and mortality in patients with decompensated cirrhosis. **Methods:**A hospital-based cross-sectional prevalence study was conducted among 100 patients with decompensated chronic liver disease admitted to Santhiram medical college and General hospital from November 2025 to April 2026. Detailed clinical evaluation, hematological investigations, coagulation profile, ultrasonography, upper gastrointestinal endoscopy, and liver biopsy whenever feasible were performed. Hematological parameters including hemoglobin, RBC indices, total and differential leukocyte counts, platelet count, prothrombin time (PT), and activated partial thromboplastin time (APTT) were analyzed. **Results:** Among the 100 patients studied, 80% were males and 20% were females. Anemia was present in 88% of patients, with normocytic normochromic anemia being the most common type (52%). Microcytic anemia was observed in 19% and macrocytic anemia in 16% of patients. Leukocytosis was present in 22% and leukopenia in 5% of patients. Thrombocytopenia was identified in 46% of patients, with severe thrombocytopenia (<50,000/mm³) occurring in 8%. Prolonged prothrombin time was observed in 60% of patients, while APTT prolongation was noted predominantly among patients with significant coagulopathy and disseminated intravascular coagulation (DIC). **Conclusion:** Hematological abnormalities are highly prevalent in decompensated chronic liver disease. Anemia, thrombocytopenia, and coagulation abnormalities are the major manifestations. Early recognition and management of these abnormalities may reduce morbidity and improve outcomes in cirrhotic patients.

KEYWORDS

Chronic Liver Disease, Cirrhosis, Anemia, Thrombocytopenia, Prothrombin Time, Hemostasis, Hematological Abnormalities.

INTRODUCTION

The liver plays a pivotal role in maintaining hematological homeostasis through storage of iron, vitamin B12, and folic acid, synthesis of clotting factors, thrombopoietin production, and regulation of fibrinolysis. Chronic liver disease results in progressive hepatic dysfunction leading to abnormalities involving red blood cells, white blood cells, platelets, and coagulation pathways.

Anemia, leukocyte abnormalities, thrombocytopenia, and coagulation defects are commonly encountered in patients with decompensated cirrhosis. These alterations may arise from hypersplenism, nutritional deficiencies, gastrointestinal bleeding, bone marrow suppression, portal hypertension, and impaired hepatic synthesis of proteins essential for hematopoiesis and hemostasis.

Despite advances in hepatology, hematological complications continue to contribute substantially to morbidity and mortality. Hence, evaluation of these abnormalities is essential for optimal management of patients with chronic liver disease.

Aim and Objectives

Aim

To assess the hematological abnormalities in a decompensated chronic liver disease patients.

Objectives

1.To detect the abnormalities in Red blood cells ,white blood cells and type of anemia in patient with chronic decompensated liver disease.

2.To detect the platelet abnormalities both quantitatively and qualitatively.

3.To assess the secretion and function of clotting factors in the patients with cirrhosis.

4.To assess coagulation abnormalities using PT and APTT.

Material and Methods

Study Design and Setting

This Hospital based cross-sectional study was conducted over a six months window (NOVEMBER 2025 to APRIL 2026) within the outpatient and wards of General medicine in Santhiram medical college and General hospital, Nandyal.

Study Population

The study comprised 100 cases with a documented,and diagnosed with decompensated chronic liver disease.

Sampling technique: Simple random sampling.

Data Collection:

All patients underwent detailed history taking, clinical examination, hematological evaluation, liver function tests, ultrasonography, upper GI endoscopy, and liver biopsy whenever indicated and feasible.

Hematological Investigations:
Hemoglobin estimation
RBC count
Packed Cell Volume
MCV, MCH, MCHC
Peripheral smear examination
Reticulocyte count
Total and differential WBC count
Platelet count
Prothrombin Time (PT)
Activated Partial Thromboplastin Time (APTT)

Inclusion and Exclusion Criteria

Inclusion Criteria:

1. All liver disease patients whose symptoms and signs persists more than 6 months2. Alcoholic and post infective, metabolic causes of liver diseases are taken for study 3.Patients who are willing to participate and willing to give informed and written consent

Exclusion Criteria:

1. Patients with known GIT malignancy or known primary hepatocellular carcinoma. 2. Patients with primary coagulation disorder. 3. Acute liver cell failure 4.Patients receiving chemotherapy or bone marrow suppressive drugs.5.Patients with chronic kidney disease or malignancy affecting hematological parameters.6.Patients who are not willing to participate and will not give informed and written consent

Clinical and Laboratory Protocols
Among the 100 patients studied:
Males: 80%
Females: 20%
Age group 40–50 years: 42%
Alcoholics among males: 62 patients
HBsAg positive: 12%
Anti-HCV positive: 1%

Serum proteins were reduced in 86% of patients and all patients demonstrated reversal of albumin-globulin ratio.

RESULTS

Table 1: RED BLOOD CELL ABNORMALITIES
Anemia was present in 88 %of patients

Type of anemia	Percentage
Normocytic Normochromic	52%
Microcytic Hypochromic	19%
Macrocytic	16%
Dimorphic	1%

Severe anemia (Hb<8g/dL) was observed in 32% patients

Table 2: WHITE BLOOD CELL and PLATELET ABNORMALITIES

Findings	Percentage
Leukocytosis	22%
Leukopenia	5%
Lymphocytosis	12%
Eosinophilia	2%
Platelets <50,000/mm	8%
Platelets 50,000-1,00,000/mm³	12%
Platelets 1-1.5lakh/mm³	26%

Thrombocytopenia (<1.5 lakh /mm³)was present in 46% of patients.

Coagulation Abnormalities
Prolonged PT: 60%
Normal PT: 40%
Significant APTT prolongation was observed in patients with severe coagulopathy and DIC.

Four patients were diagnosed with disseminated intravascular coagulation.

DISCUSSION

The present study demonstrates that hematological abnormalities are highly prevalent among patients with decompensated chronic liver disease.

Anemia was the commonest abnormality, occurring in 88% of patients. Normocytic normochromic anemia was the predominant pattern, consistent with previous studies by Kimber et al. and Sheehy et al. Severe anemia was largely attributed to gastrointestinal blood loss, nutritional deficiencies, and hypersplenism.

Macrocytosis was predominantly observed among alcoholics and may be explained by direct alcohol-induced marrow toxicity and disturbances in folate and vitamin B12 metabolism. Microcytic anemia reflected chronic blood loss and iron deficiency.

Leukocytosis was mainly associated with spontaneous bacterial peritonitis and secondary infections. Leukopenia was relatively uncommon and likely resulted from hypersplenism and marrow suppression.

Thrombocytopenia was observed in nearly half of the study population and correlated strongly with splenomegaly and portal hypertension. Reduced thrombopoietin production and splenic sequestration are probable mechanisms.

Coagulation abnormalities were frequent, with PT prolongation observed in 60% of patients, reflecting impaired hepatic synthesis of clotting factors. Significant APTT prolongation and severe thrombocytopenia were particularly evident among patients with DIC.

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