



A STUDY OF HAEMATOLOGICAL ABNORMALITIES IN CHRONIC LIVER DISEASE IN AJMER REGION

Dr. Kishan Machiwal	Resident doctor, Department of Pathology, JLN Medical College, Ajmer.
Dr. Neena Kasliwal	Senior Professor, Department of Pathology, JLN Medical College, Ajmer,
Dr. Deepali Jain	Associate Professor, Department of Pathology, JLN Medical College, Ajmer,
Dr. Bhawika Menghani*	Resident doctor, Department of Pathology, JLN Medical College, Ajmer. *Corresponding Author

ABSTRACT Chronic liver disease refers to a disease of the liver, which had lasted more than six months. The disease process involves progressive destruction and regeneration of liver parenchyma leading to fibrosis and cirrhosis. This study evaluates the various hematological indices as these parameters are part of an inexpensive, easily accessible, and routinely performed test for almost all patients admitted to health facilities to find out a correlation between variation in hematological parameters and the illness under study. This study is conducted in the department of Pathology J.L.N Medical College and Associated group of hospitals, Ajmer (Rajasthan) prospectively from July 2019 to June 2020 (one year). In our study, the mean age for chronic liver disease was 44.48 ± 11.84 years and the highest incidence was seen between the age group of 41-50 years (4th decade). M: F ratio was 6:1. Alcohol has been implicated as the most common cause. In the case of non-alcoholic hepatitis B has been implicated as the most common cause. The most common anemia is normocytic normochromic anemia. Microcytic anemia is most common among women. Macrocytosis is almost common with alcoholics. The mean MCV, MCH and MCHC were significantly higher in alcoholic chronic liver disease patients. Thrombocytopenia is present in more than 30% of patients. In chronic liver failure patients, most of them had abnormalities in hematological parameters. Hence with this study, all the chronic liver disease patients must be evaluated for hematological and should be monitored for any complications. Early treatment to correct these comorbidities can decrease mortality.

KEYWORDS : Chronic liver disease, anemia

INTRODUCTION

The liver is the largest organ of the body weighing 1-1.5 kg, which is 1.5-2.5% of the body mass. It performs numerous functions and vital roles in maintaining homeostasis and health. [1,2] Hence, liver diseases cause a wide range of abnormalities in hematological parameters. Peripheral blood picture in chronic liver disease is influenced by the presence of jaundice, liver cell failure, portal hypertension, hypersplenism, and reduced red cell half-life. Both cholestasis and hepatocellular failure can derange the coagulation system. [3]

Chronic Liver Disease (CLD) refers to a disease of the liver, which had lasted more than six months. The disease process involves progressive destruction and regeneration of liver parenchyma leading to fibrosis and cirrhosis. [4] Typical presenting symptoms of liver disease include fatigue, jaundice, itching, nausea, poor appetite, edema, abdominal distension, intestinal bleeding, and right upper quadrant pain. The progression of the alcoholic disease is characterized by steatosis, inflammation, necrosis, and cirrhosis. [5] Anemia of diverse etiology occurs in about 75% of patients with chronic liver disease. [6]

Causes of anemia in chronic liver disease include iron deficiency anemia, hypersplenism, anemia due to chronic disease, autoimmune hemolytic anemia, folic acid deficiency, aplastic anemia, and as an effect of the anti-viral drug. The major cause of anemia associated with chronic liver disease is hemorrhage specifically gastrointestinal bleeding and hypersplenism secondary to portal hypertension. In patients with alcoholic liver disease, the different effects of alcohol may contribute to anemia such as malabsorption, malnutrition, and direct toxic effect. [7]

Thrombocytopenia can often be used as a marker of advanced liver disease and according to some studies moderate-to-severe thrombocytopenia is a strong independent predictor of mortality. It is also associated with an increased bleeding tendency in CLD patients, so early detection of thrombocytopenia is important and helpful for decreasing mortality and morbidity.

Changes in WBC may be associated with CLD, it is mainly due to PHTN-induced splenic sequestration, changes in granulocyte colony-stimulating factor, granulocyte-macrophage colony-stimulating factor, bone marrow suppression, and infection. [8]

The hematological abnormalities in a chronic liver disease add morbidity to the primary pathology and increase mortality. Hence, it becomes necessary to investigate the hematological abnormalities and hemostatic abnormalities to decrease the comorbidity. [9]

This study evaluates the various hematological indices as these parameters are part of an inexpensive, easily accessible, and routinely performed test for almost all patients admitted to the health facilities to find out a correlation between variation in hematological parameters. These parameters can be used to assess the hematological abnormalities and the nature of hematological abnormalities so that the treatment can be done towards the line to decrease the morbidity.

Materials and Methods

This study was conducted in the department of Pathology J.L.N Medical College and Associated group of hospitals, Ajmer (Rajasthan) prospectively from July 2019 to June 2020 (one year). This study was conducted among patients admitted to medical wards of the Medicine Department, JLN Medical College and group of Hospitals, Ajmer.

All those patients whose signs and symptoms of liver disease persist more than 6 months due to alcoholic, post-infective or metabolic cause is included in this study. The sample is received in the central laboratory of J.L.N. Medical College and Associated group of Hospitals, Ajmer (Rajasthan).

Patients with known GIT malignancy or known primary hepatocellular carcinoma, patients with a primary coagulation disorder, acute liver failure, liver cell failure due to septicemia or endotoxemia other than primary liver cause are excluded from the study.

5ml of venous blood sample is collected aseptically by standard phlebotomy technique from each subject into tri-potassium ethylenediamine tetra-acetic acid (K3EDTA) anticoagulant containing vial and sodium citrate vial and were analyzed using automated analyzer (SYSMEX XP-100, SYSMEX XS-800i, SYSMEX XN-550).

RESULTS

The present study included 120 cases of chronic liver disease study subject for a duration of one year prospectively from July 2019 to June

2020 in the department of Pathology J.L.N Medical College and associated group of hospitals, Ajmer (Rajasthan).

Out of 120 cases studied mean age of patients was 44.48±11.84 years. The most common age range for chronic liver disease was 16 - 72yrs. 104 cases (86.7%) were male and 16 cases (13.3%) were females. Most common complaint of presentation was weakness and fatigability.

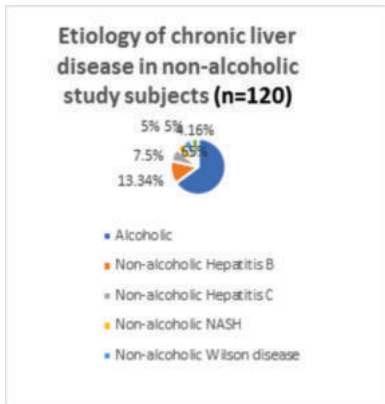


Chart 1: Shows the etiology of chronic liver disease in study subjects. Out of 120 cases, 78 (65.0%) cases had alcoholic etiology and 42 (35%) had non-alcoholic etiology of chronic liver disease. Among 42 cases of non-alcoholic etiology 16 cases (13.3%) were of Hepatitis B, 9 cases (7.5%) were of Hepatitis C, 6 cases (5%) were of NASH (Non-alcoholic Steatohepatitis), 6 cases (5%) were of Wilson disease, 5 cases (4.1%) have associated autoimmune disease. Alcohol is the most common cause of chronic liver disease and among Non-Alcoholic cause hepatitis B is most common cause of chronic liver disease.

Table: 1 Shows the comparison of mean of various hematological parameters in alcoholic and non-alcoholic chronic liver disease study subjects. The mean MCV in alcoholic chronic liver disease was 90.91±11.47 and in non-alcoholic chronic liver disease was 80.92±10.26 which is significantly higher in alcoholic chronic liver disease (P value <0.001). The mean MCH in alcoholic chronic liver disease was 29.26±3.39 and in non-alcoholic chronic liver disease was 26.09±3.14 which was significantly higher in alcoholic chronic liver disease (P value <0.001). The mean MCH in alcoholic chronic liver disease was 29.26±3.39 and in non-alcoholic chronic liver disease was 26.09±3.14 which was significantly higher in alcoholic chronic liver disease (P value <0.01). The mean MCV, MCH and MCHC were significantly higher in alcoholic chronic liver disease patients as compared to non-alcoholic chronic liver disease study subjects (p value <0.05).

Table 1: Comparison of hematological parameter in alcoholic chronic liver disease and non-alcoholic chronic liver disease

	Alcoholic chronic liver disease (n=78)	Non-alcoholic chronic liver disease (n=42)	P value
RBC count	3.28±0.57	3.44±0.56	0.14
PCV	29.96±5.12	28.90±4.73	0.26
MCV	90.91±11.47	80.92±10.26	<0.001
MCH	29.26±3.39	26.09±3.14	<0.001
MCHC	34.60±1.78	33.41±2.33	<0.01
TLC	9379.74±3714.05	8065.0±3509.98	0.07
Platelets	160273.08±87879.43	198809.52±129517.34	0.15

Table 2: Comparison of pattern of peripheral blood smear in male and female

Peripheral blood smear	Male (n=104)	Female (n=16)	P value
Dimorphic	3 (2.9%)	0	1.0
Macrocytic	32 (30.8%)	0	<0.01
Microcytic	12 (11.5%)	10 (62.5%)	<0.001
Normocytic	57 (54.8%)	6 (37.5%)	0.19

DISCUSSION

Chronic liver disease occurs when permanent structural changes within the liver occur secondarily to longstanding hepatocyte damage. [10] Anemia is common in chronic liver disease and occurs in about

two-thirds of patients with cirrhosis. It is usually moderate in degree but occasionally is severe. Sometimes the cause of the anemia is multifactorial.

In our study, the most common age range for chronic liver disease was 16 - 72yrs, which was similar to the studies performed by Rajkumar Solomon et al [11], Ravila Raja et al [12]. In the present study, there is a male preponderance in chronic liver disease study subjects which was similar to the studies performed by Om K Phatak et al [13], Shivam Khare et al [14].

In the present study, the most common etiological agent responsible for chronic liver disease is alcohol which was similar to the studies performed by Dr. S Selvamani et al [15], Dr. Sudhir Chandra Jha et al [16]. In the present study the most common finding observed in the peripheral blood smear was normocytic picture of RBC and the least common was the dimorphic picture. These findings were similar to the findings observed by the studies done by Shivam Khare et al [14], Dr. S Selvamani et al [15], Kesavadas SM et al [3].

CONCLUSIONS

According to the study, the most common anemia in chronic liver disease was normocytic normochromic anemia. Microcytosis was observed in patients with bleeding tendencies and macrocytosis was observed mostly in alcoholics. Leucopenia was observed in a small fraction of patients and leucocytosis was observed in patients with history of repeated paracentesis and peritonitis. Thrombocytopenia was present in most of the chronic liver disease patients and was associated with increased bleeding tendencies. Most of the patients had raised prothrombin time and INR due to decreased synthesis of clotting factors.

Thus, in chronic liver disease patients, most of them had abnormalities in hematological parameters. Hence with this study all the chronic liver disease patients must be evaluated for hematological abnormalities and should be monitored for any complications. Early treatment to correct these comorbidities can decrease the mortality.

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