



Patterns of Anaemia of Chronic Liver Disease Patient; A Cross-Sectional Study

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Abstract: Liver diseases are frequently associated with hematological abnormality. Anaemia of diverse etiology occurs in 75% of patient with chronic liver disease. The present study aimed to find out the prevalence and type of anaemia among chronic liver disease patient. This cross-sectional type of observation study was conducted among 138 patients attended and admitted in DMCH and BSMMU. Haemoglobin level was determined by using automated haematology analyzer. Morphological type of anaemia was studied and anaemia is defined by WHO. A total number of 138 CLD patients are evaluated. The mean age \pm SD of participants is 38.27 ± 16.20 with range of 10-80 years. The distribution of patients according to sex, male 79.0% is predominant and female (21.0%). Mean haemoglobin (gm/dL) is found in 9.30 ± 2.45 . Haemoglobin is decreased among the CLD patients, moderate form of anaemia (39.2%) in majority of patients followed by mild form (27.5%) and severe form only (5.8%). Anaemia is prominent finding in this study, severity of anaemia is mild to moderate in majority cases and normochromic normocytic anaemia is predominant than other type of anaemia. Early recognition of these potentially treatable condition can help in achieving better outcome.

Keywords: Anaemia, Haemoglobin, Chronic liver disease, Bangladesh.

Article at a glance:

Study Purpose: To determine the prevalence and types of anaemia in patients with chronic liver disease.

Key findings: Anaemia is prevalent in 75% of chronic liver disease patients, with varying etiologies and morphological types.

Newer findings: The study provides insights into the specific types of anaemia commonly observed in chronic liver disease patients and the relationship between liver dysfunction and haematological abnormalities. It emphasizes the need for targeted anaemia management in these patients.

Abbreviations: ALT: HB – Hemoglobin, WHO – World Health Organization, DMCH – Dhaka Medical College Hospital, BSMMU – Bangabandhu Sheikh Mujib Medical University.

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INTRODUCTION

Chronic liver diseases (CLDs) are major causes of morbidity and mortality worldwide. ¹ It is commonly encountered all over the world. ² Chronic liver disease is the tenth leading cause of death in the United States (US) with over 25,000 deaths annually ³. Anaemia is a common finding. The causes of anaemia in liver disease are multifactorial, resulting from intravascular dilution

due to hypervolemia, impaired ability of the marrow to respond optimally to the anemia. In some patients, a severe haemolytic anaemia is associated with morphologically abnormal erythrocytes (spur cells). The anaemia of Chronic liver disease is usually mild to moderate. In cirrhotic patients, the Hb level, an remains above 10 g/dl in the absence of bleeding or severe haemolysis. Morohologically, the anaemia of liver

disease is mildly macrocytic: the MCV rarely exceeds 115 fl in the absence of megaloblastic changes in the bone marrow.

Vitamin B12 levels are normal or high, folate levels are often low, owing to poor dietary intake. In addition, liver disease is associated with thin macrocytes, defined as cells with increased surface area but without a corresponding increase in volume. The increased surface area of thin macrocytes is the consequence of excessive membrane lipids, especially cholesterol, but also phospholipids. On the blood smear, thin macrocytes are characterized by an increased diameter and a visibly enlarged area of central pallor. The characteristic target cell of liver disease is a thin macrocyte and can have abnormal shapes –target cells and spur cells – owing to membrane abnormalities. Because the volume of such cells is normal, their presence has no effect on the erythrocyte indices. Bleeding produces a hypochromic microcytic picture. Alcohol causes macrocytosis, sometimes with leucopenia and thrombocytopenia due to bone marrow suppression.

Hypersplenism results in pancytopenia. Cholestasis can often produce abnormal-shaped cells and also deficiency of Vitamin K. Haemolysis accompanies acute liver failure and jaundice. Aplastic anaemia is present in up to 2% of patients with acute viral hepatitis. A raised serum ferritin with transferrin saturation (> 60%) is seen in hereditary haemochromatosis. So CLD is responsible for various haematological abnormality due to its unique portal circulation, synthetic and immune function. Anaemia is much more common. Pancytopenia and sometime leucocytosis are associated with it. In CLD patient, morbidity and mortality is caused by underlying haematological abnormality still undiagnosed. If abnormal haemogram associated with CLD is diagnosed early, then appropriate measure can be taken to reduce morbidity and mortality. The major sources of chronic hepatitis are due to infection with hepatitis B and C. Globally, chronic viral hepatitis infections account for the majority of liver disease, both cirrhosis of the liver and hepatocellular carcinoma (HCC), in nearly all

regions of the world. To see the haematological cellular abnormality among the CLD patients this study is undertaken.

METHODS

It was a cross-sectional type of observation study. All patients at age between 10-80 years with both sexes presented with CLD is included as study population. The demographic profiles including age, sex, height, weight was recorded. Baseline laboratory investigation like CBC, other blood parameters like blood urea, serum creatinine were done. All patients age between 10- 80 years with both sexes presented with CLD who were attended in outpatients Department of Haematology, Dhaka Medical College & Hospital, and admitted in Department of Gastroenterology, Department of medicine, Dhaka Medical College & Hospital, Department of Hepatology, BSMMU and were enrolled as study population.

This study was conducted from July 2011 to July 2012 for a period of one (01) year. The patients were voluntarily included in the study with their consent, and they were neither supported nor additionally burdened financially. Patients with CLD, aged ≥ 10 years, of both sexes, attended and admitted to the aforementioned department, able to conduct the laboratory tests and conscious to provide consent were included in the study. Patients aged <10 years, unconscious, and unable to conduct the laboratory tests were excluded from the study. A total number of 138 patients were taken as study population. Sample size was calculated by using appropriate formula.⁴ The sampling technique was consecutive sampling and was purposive sampling technique.

The entire collected data will be compiled on a master chart first and then statistical analysis of the results will be obtained by using Windows-based computer software devised with Statistical Packages for Social Sciences (SPSS-17) (SPSS Inc, Chicago, IL, USA). Qualitative data will be expressed as frequency and quantitative data will be expressed as mean with standard deviation. The results will be presented in tables, figures, diagrams.

RESULTS

Distribution of study population according to investigation (haemogram) (n=138).

Table 1: Distribution of patients according to age group (n=138)

Age group	Frequency	Percent
10-20	24	17.4
21 – 30	28	20.3
31 – 40	32	23.2
41 – 50	20	14.5
51 – 60	19	13.8
60-80	15	10.9
Total	138	100.0
Mean ± SD	38.27 ± 16.20	10 – 80

Table 1 shows the distribution of patients according to age group. Among 138 patients less than 21 years is in 24(17.4%) cases, 28 (20.3%) cases in group 21 – 30 years, 32 (23.2%) cases in group 31

– 40 years, 20 (14.5%) cases in group 41 – 50 years, 19 (13.8%) cases in group 51 – 60 years and 15 (10.9%) in above 60 years. The mean ± SD is 38.27 ± 16.20 with a range of 10 – 80 years

Table 2: Distribution of study population according to anaemia (n=138)

Anaemia	Frequency	Percent
Severe	8	5.8
Moderate	54	39.2
Mild	38	27.5
Normal	38	27.5
Total	138	100.0

(Severe: Hb <7gm/dl; Moderate: Hb = 7-10gm/dl; Mild: Hb = 10 to lower limit of normal gm/dl [Source: WHO])

Table 2 shows the distribution of patients according to anaemia. Among 138 patients severe form of anaemia is detected among 8 (5.8%) cases.

Moderate form of anaemia is found in 54 (39.2%) cases. And 38 (27.5%) are mild anaemia. No anaemia is found in 38(27.5%) cases.

Table 3: Distribution of study population according to peripheral blood film (n=138)

Peripheral blood film	Frequency	Percent
Non Specific finding	30	21.7
Normochromic normocytic anaemia	55	39.9
Macrocytic anaemia	26	18.8
Pancytopenia	23	16.7
Microcytic anaemia	4	2.9
Total	138	100.0

Table 3 shows the distribution of study population according to peripheral blood film. Normochromic normocytic anaemia(80-95fl) is the most common reported which is 55(39.9%) cases followed by macrocytic(>98fl) anaemia and

Pancytopenia which are 26(18.8%) cases and 23(16.7%) cases respectively. Microcytic(<76fl) anaemia is found in 4(2.9%) cases. Non-Specific finding is reported in 30(21.7%) cases.

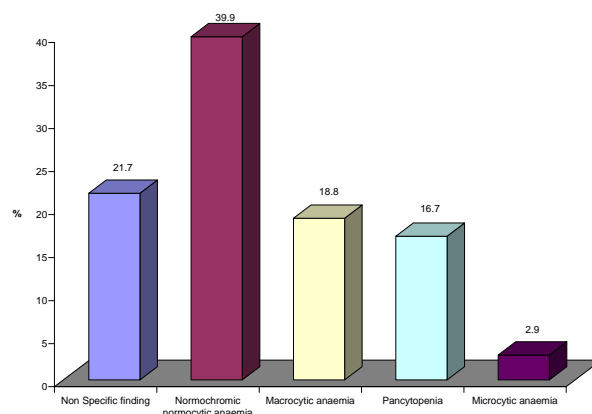


Figure 1: Bar diagram of study population according to anaemia

DISCUSSION

Chronic liver diseases (CLDs) are one of the most important causes of morbidity and mortality globally which is commonly encountered all countries in the world.¹ CLDs are frequently associated with haematological abnormality.⁵ A total number of 138 CLD patients are evaluated to see the haemogram. The distribution of patients according to age group is recorded. Among all patients 24(17.4%) cases are less than 21 years, 21–30 years age group in 28(20.3%) cases, 31–40 years age group in 32(23.2%) cases, 41–50 years age group in 20(14.5%) cases, 51–60 years age group in 19(13.8%) cases and 15(0.9%) in above 60 years in age group. The mean age with \pm SD is 38.27 ± 16.20 with a range of 10 – 80 years. The distribution of patients according to sex is reported in this study. Male 109(79.0%) is predominant than female 29(21.0%). The male and female ratio is 1: 0.27. It is very clear from this study result that male are more commonly affected by CLD. Similar result was reported by and has mentioned that male is predominant than female.^{1,2} has mentioned that the chance of CLDs is 2 times more than female which is consistent with the present study. The distribution of study population according to investigation (haemogram) is recorded. The mean RBC ($\times 10^{12}/L$) is found in 3.55 ± 1.08 . The mean Hb (gm/dl) is found in 9.30 ± 2.45 . The haemoglobin level is decreased among the CLDs patients.

The distribution of patients according to anaemia is recorded. Among patients, moderate form 54(39.2%) of anaemia is found in majority of the patients followed by mild form 38(27.5%). Severe form of anaemia is detected only in 8(5.8%)

cases. RBCs are found normal in 38(27.5%) cases. It is well established that CLDs are associated with haematological abnormality.⁶ has reported that anaemia of diverse aetiology occurs in the patients with chronic liver disease.² has also found similar result and has mentioned that it results from a combination of intravascular dilution due to fluid over load, shortened red cell survival, impaired ability of marrow to respond optimally to the anaemia. The distribution of study population according to peripheral blood film is recorded. Normochromic normocytic anaemia 55(39.9%) is the most common reported followed by macrocytic anaemia 26(18.8%) and pancytopenia 23(16.7%). Microcytic anaemia is found in 4(2.9%) cases.⁵ has reported that anaemia is commonly found in CLDs patients which is consistent with the present study. Some patients develop a severe haemolytic anaemia associated with morphologically abnormal erythrocyte known as spur cell.⁵ Haemolytic anaemia also may occur in Wilson's disease (1-2%) and drug.⁷ Microcytic hypochromic anaemia is also reported by which is similar with the present study.⁸⁻¹⁰ However, the development of pancytopenia and hypocellular bone marrow in relation to occurrence of CLDs has been reported by.⁵ It has been reported that anaemia of diverse aetiology occurs in 75% of patients with chronic liver disease⁶ and it is a common finding.

CONCLUSION

CLD causes greater ranges of haematological change. Anaemia is more prominent findings of this study. Severity of majority cases is mild to moderate and normochromic normocytic anaemia is predominant

than other types of anaemia. Early recognition of these condition can help in achieving better outcome of chronic liver disease patients.

REFERENCE

1. Younossi, ZM., Stepanova, M., Afendy, M., Fang, Y., Younossi, Y., Mir, H. & Srishord, M. Changes in the prevalence of the most common causes of chronic liver diseases in the United States from 1988 to 2008. *Clinical Gastroenterology and Hepatology*. *ClinicalGastroenterology and Hepatology* 2011;9:524–5302
2. Khokhar N. Spectrum of chronic liver disease in a tertiary care hospital. *Spectrum, JPMA* 2002;52:56
3. Riley TR, Smith JP. Preventive care in chronic liver disease. *J Gen Intern Med* 1999;14(11):699-704
4. Beth Dawson (Author), Robert G. Trapp (Author) ... by Beth Dawson. *Lange Medical Books / McGraw-Hill*; 4th edition (April 15, 2004)
5. Giannini, E.G., Review article: thrombocytopenia in chronic liver disease and pharmacologic treatment options. *Alimentary pharmacology & therapeutics*, 2006. 23(8): p. 1055-1065
6. McHuchison JG, Manns MP, Longo DL. Definition and management of anaemia in patients infected with hepatitis C virus. *Liver int.* 2006;26:389-398
7. Robrts EA, Schilsky ML. American Association for study of liver disease (AASID). Practice guidelines on Wilson disease. *Hepatology*. 2003;37:1475-92
8. Gonzalez-Casas R. Spectrum of anaemia associated with chronic liver disease. *World Journal of Gastroenter*, 2009; 15(37):23-26
9. Sarker, N., Kona, K. S., & Mohiuddin, A. H. (2014). Knowledge and Practice level regrading Prevention and Nutritional Management of Hepatitis B among Blood Donors in some Selected Territory Hospital of Dhaka City Bangladesh. *IAR Journal of Medicine and Surgery Research*, 5(6), 109-118
10. Zieve L. Jaundice, hyperlipidemia and haemolytic anaemia: heretofore unrecognized syndrome associated with alcoholic liver cirrhosis. *Ann Intern medicine* 1958;48;471-96

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