International Journal of Medicine Research
www.medicinesjournal.com
ISSN: 2455-7404
Received: 05-01-2023, Accepted: 21-01-2023, Published: 07-02-2023
Volume 8, Issue 1, 2023, Page No. 7-10

A cross sectional study on anaemia profile among chronic liver disease patients admitted in a tertiary care centre of Karnataka

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Abstract
Introduction: Anemia is a frequently observed manifestation during the clinical course of chronic liver disease and occurs in up to 75% of patients. This study was conducted to describe type of anemia in patients with CLD from RBC indices, peripheral smear, iron profile, Vitamin Assay.
Objectives
1. To detect the abnormalities of RBCs in a chronic liver disease patient.
2. To find the type of anaemia in patient with chronic liver disease from peripheral smear & RBC indices

Materials & methods: A cross sectional study was conducted among 50 CLD patients admitted at KVGMCH, sullia between December 2021 to april 2022. Data was collected in terms of history, clinical findings & laboratory parameters. Data was analysed using standard statistical tests.
Result: The mean age of males and females were 56.51 and 66 years respectively.
Mean Hb, MCV, MCH, MCHC were 8.96, 78.8, 26.1, 32.9 respectively. S. Iron & ferritin were 36.8 µg/dl, 66.5 ng/ml respectively. Peripheral smear showed Microcytic hypochromic anemia in 84% of the patients.
Conclusion: This study shows that Iron deficiency anemia is most commonly seen in CLD patients.

Keywords: *Rhododendron arboreum*, *R. campanulatum*, Jack bean urease, leaf extract, inhibition

Introduction

Anaemia is the most common complication of liver cirrhosis and it is seen in 75% of cases [1]. The etiology of anemia in liver disease is diverse and often multifactorial. Common causes include acute and chronic blood loss due to upper GI bleeding, malnutrition, hypersplenism secondary to portal hypertension & impaired coagulation [2, 3]. Anaemia was defined according to WHO's criteria (Hb<13g/dl in males and <12g/dl in females).

Alcohol causes anaemia by its direct bone marrow toxicity, Vitamin B12 & folate deficiency due to poor oral intake and intestinal malabsorption.

When liver cirrhosis sets in, synthesis & immune functions of liver are adversely affected. RBC indices are abnormal in many patients of CLD & presence of cytopenias has an adverse impact on the prognosis of the patient.

This study was conducted to describe the type of anaemia in patients with CLD from RBC indices, Peripheral Smear, Iron Profile & Vitamin assay

Objectives

1. To detect the abnormalities in RBCs in a CLD patient.
2. To find out the type of anaemia in patients with CLD

Materials and methods

This was a cross sectional study. This was conducted on patients admitted in medicine department of KVGMCH, Sullia, D.K, during the period of December 2021 to April 2022. This study was approved by the ethical committee.

This study was conducted to describe the type of anaemia in patients with CLD from RBC indices, Peripheral Smear, Iron profile, Vitamin assays.

- From a study conducted by Dr. Gajanam Balaji *et al* at pune, it was found that 91% of CLD patients were anaemic.
- Using the formulae Z2 p(1-p)/L2, sample size was calculated with p = 91%, q = 9%, L (allowable error) = 8%

$$\text{Minimum sample size} = \frac{(1.96)^2 \times (91) \times (9)}{8^2} = 49.14$$

Approximately 50.

Inclusion criteria

- All liver disease patients of age > 18 years whose symptoms & signs persisted > 6 months.

Exclusion criteria

- Patients with k/c/o HCC or GI malignancy
- Acute liver cell failure
- Patients on drugs such as glucocorticoids, estrogen, tamoxifen, OC pills.
- Previous history of hematological/ coagulation disorders other than CLD

Observations

Table 1: age and gender distribution of the study population

S. No.	Age distribution	Male	Female	Total
1	41 – 50 Years	7 (14%)	0 (0%)	7 (14%)
2	51 – 60 Years	21 (42%)	2 (4%)	23 (46%)
3	61 – 70 Years	13 (26%)	5 (10%)	18 (36%)
4	71 – 80 Years	0 (0%)	2 (4%)	2 (4%)
	TOTAL	41 (82%)	9 (18%)	50 (100%)
	MEAN AGE	56.61 ± 6.62	66 ± 7.81	58.3 ± 7.68

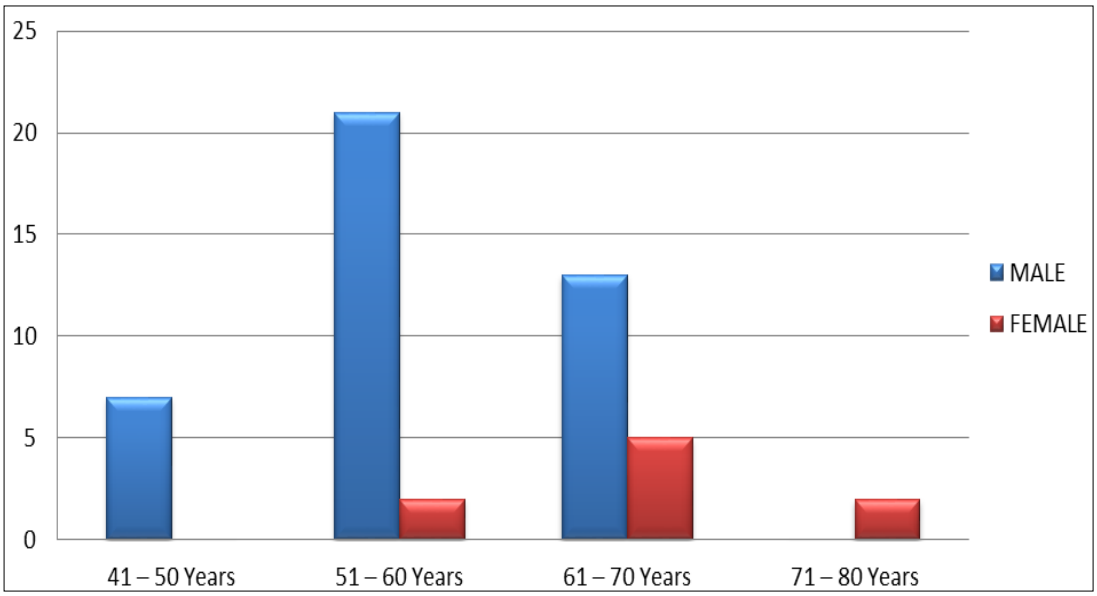

Fig 1: Age and gender distribution of the study population

Maximum number of study participants belonged to the age group 51 – 60 Years and accounted for 46% of the total study population, followed by 36% in the age group of 61 – 70 years. The mean age of the study participants was 58.3 year. The mean age of males and females were 56.51 and 66 years respectively. Only 2(4%) of the participants belonged to 71 – 80 years age group and both were females.

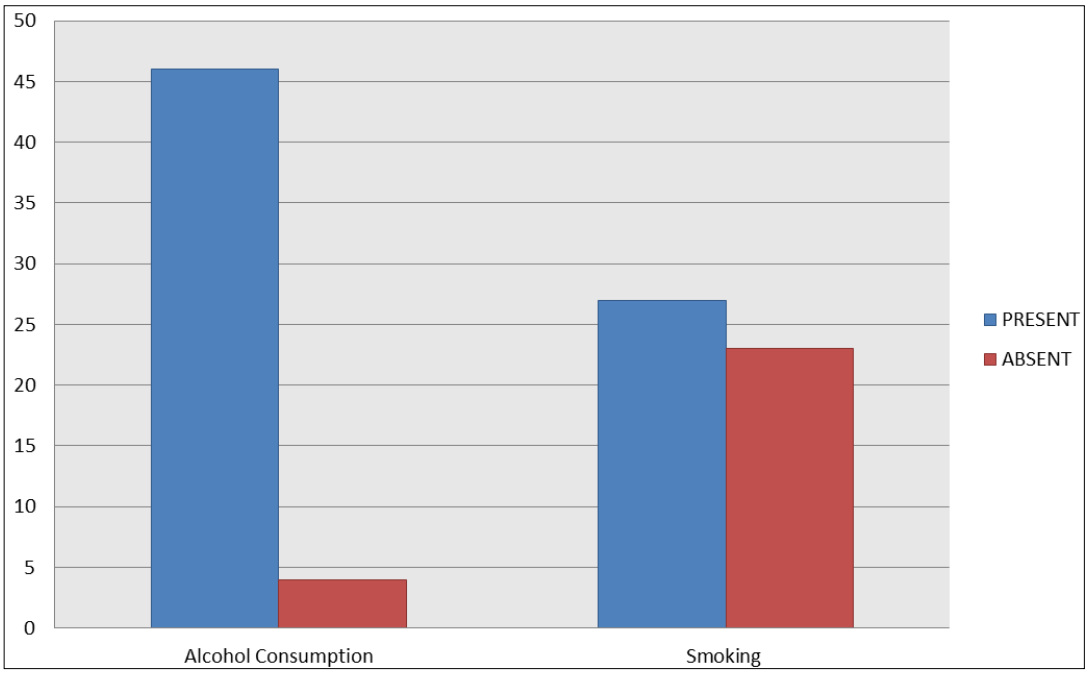

Fig 2: history of alcohol consumption and smoking in the study population

92% of the studied CLD patients had a h/o consumption of alcohol. Only 8% did admit to have the habit of consuming alcohol. 54% of the study population had a habit of smoking.

Table 2: haemoglobin values in the study population

	Haemoglobin values	No. of patients	Percentage
1	> 10 g/dl	4	8%
2	9 – 10 g/dl	29	58%
3	8 – 9 g/dl	15	30%
4	< 8 g/dl	2	4%
	Mean Haemoglobin value	8.95 ± 0.76	

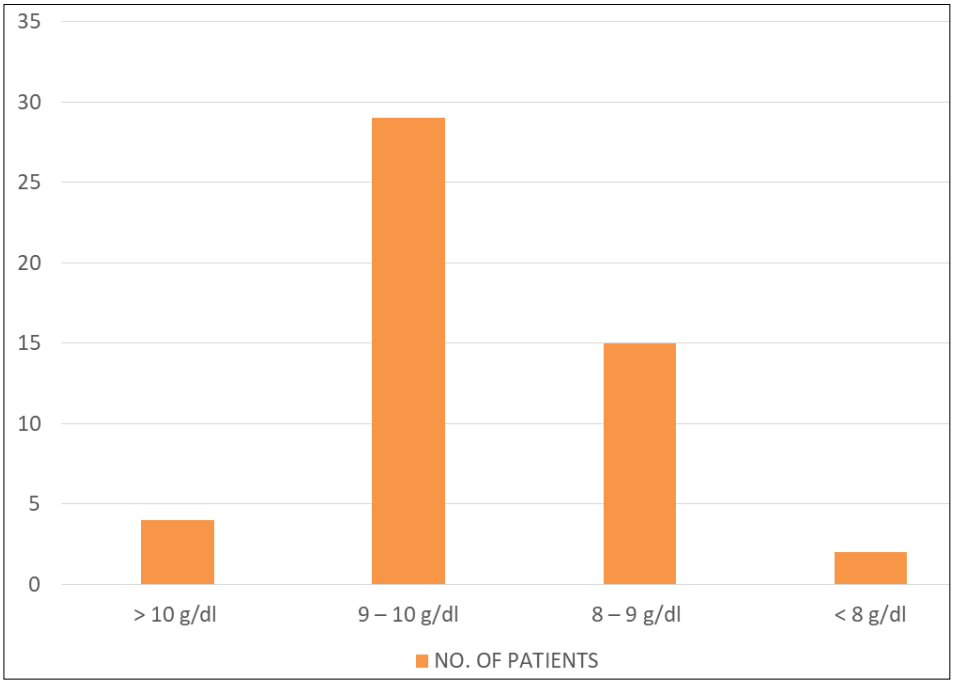

Fig 3: haemoglobin values of the study population

The mean haemoglobin of the study population was 8.95g/dl. There were 64% of the patients who had their haemoglobin values between 9 and 10g/dl. 32% of them had their Hb values between 8 and 9 g/dl. There were 2 (4%) of the patient who had their haemoglobin values below 8g/dl

Table 3: peripheral smear report of the study population

S no.	Peripheral smear findings	No. Of patients	Percentage
1	Microcytic Hypochromic Anaemia	42	84%
2	Macrocytic Anaemia	4	8%
3	Normocytic Normochromic Anaemia	4	8%

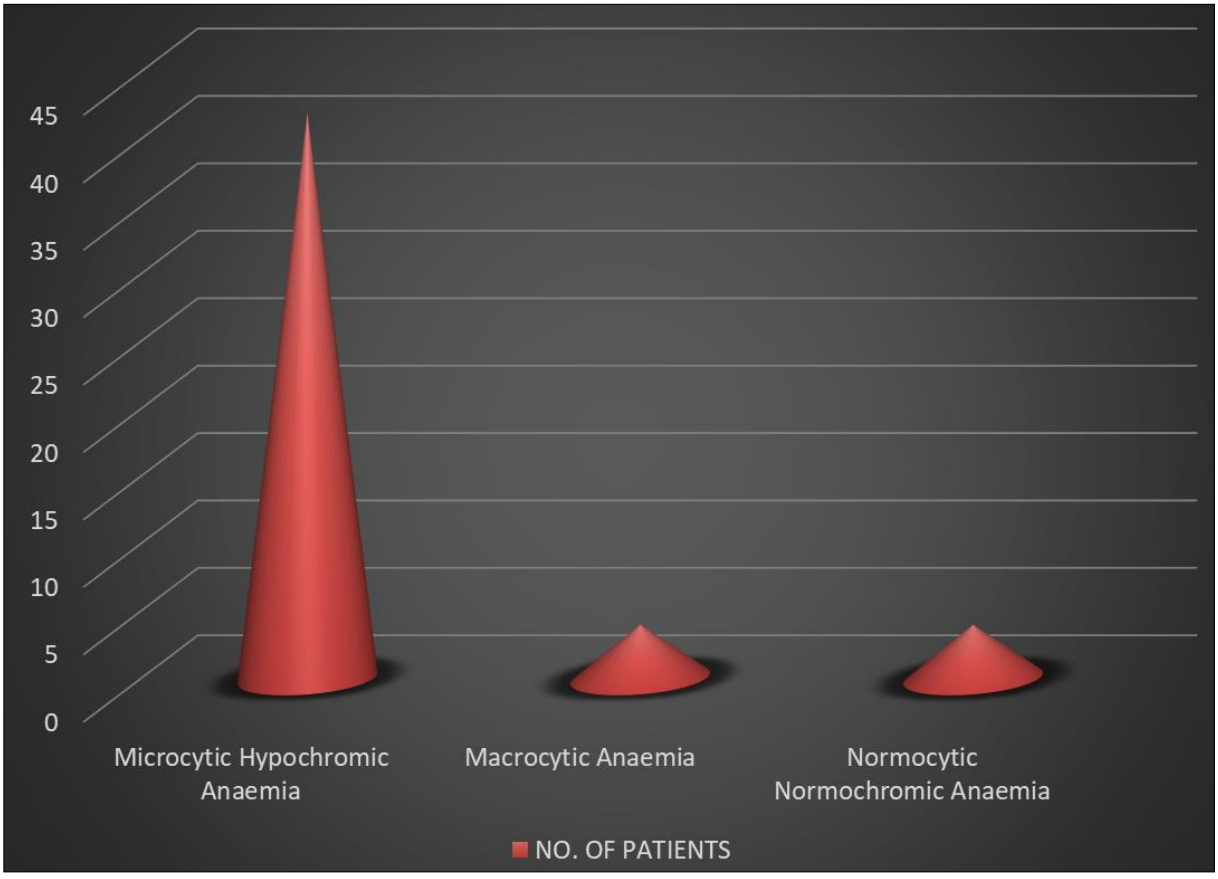

Fig 4: peripheral smear report in the study population

Table 4: erythrocyte indices in the study population

S no.	Erythrocyte indices	Values	No. Of patients
1	MCV	<80fl	38
		80 – 100fl	8
		> 100fl	4
2	MCH	< 27pg	32
		27 -34pg	12
		> 34pg	3
3	MCHC	<32 g/dl	39
		32 – 36g/dl	7
		>36g/dl	4

Results

A total of 50 patients were included in the study. Of which 41 were males and 9 were females. The mean age of male and females were 56 and 66 respectively. Mean Hb, MCV, MCH, MCHC were 8.96, 78.8, 26.1, 32.9 respectively. Mean S. Iron & ferritin were 36.8 µg/dl and 66.5 ng/ml respectively. Peripheral smear showed Microcytic Hypochromic anaemia in 84% of the patients. 8 % of the patients had Vitamin B12 deficiency.

Discussion

In this study, 88 % of the patients had mild to moderate anaemia with microcytic hypochromic anaemia being the most common. Alcoholism is the most commonest cause of CLD in this study. Anaemia in CLD may be due to the following causes [4, 5, 6] a) Haemodilution b) decreased production of erythropoietin by kidneys c) ineffective erythropoiesis d) anaemia of chronic disease e) nutritional deficiency f) CLD leads to altered metabolism of cholesterol. Hyperlipidemia causes stiffening of RBC membranes leading to increased destruction when they pass through spleen. This acute metabolic condition (Zeive's syndrome) [7] is seen during alcohol withdrawal.

Anaemia is seen in approximately 75 – 80 % of patients with CLD [1, 3, 7]. Most commonly normocytic normochromic is usually seen, but in our study Microcytic Hypochromic anaemia was seen. Microcytic Hypochromic anaemia is seen in CLD due to a) bleeding from esophageal varices b) peptic ulcer c) esophagitis d) hemolysis due to Zeive's syndrome, hypersplenism etc.

Conclusion

This study shows that mild to moderate anaemia is common in patients with CLD & most common type is Microcytic Hypochromic anaemia (iron deficiency anaemia). In patients with chronic liver disease and more so with alcoholic liver disease, the reasons for anaemia may be varied and may range from malabsorption to malnutrition to direct toxic effect. Thus the pathogenesis for anaemia is different in each individual and it is important to begin specific therapy in each condition.

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