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RESEARCH ARTICLE

Study of Hematological Abnormalities in Chronic Liver Disease

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Abstract

Background: Hematological abnormalities are common finding in Chronic Liver Diseaese(CLD). This study is conducted to assess the hematological abnormalities and Hemostatic derangements in CLD patients.Broadly, Hematological abnormalities are viewed under abnormalities in RBC'S,WBC'S, Platelets and Coagulation profile.
Objectives: To study Hematological abnormalities in Chronic Liver Disease patients.
Methods: I performed a cross sectional observation study in which 106 Chronic Liver Disease have been studied from November 2021 to November 2022 ,in KR Hospital Mysuru, Karnataka. SPSS software was used for statistical analysis of the data and P value less than 0.05 was considered significant
Results:102 males and 4 females were enrolled in this study.Mean age group among males was 50.97 years and females was 52 years. Mean Hemoglobin in male subjects was 10.17g/dl and female subjects was 8.63g/dl. Mean platelet count in males was 103411c/microL and females was 85000c/microL. Normocytic anemia is majorly prevalent across both gender groups than Macrocytic. Majority of the study population has mild to moderate anemia. No significant variation in WBC count was noted.Vast majority had deranged coagulation cascade(prolonged PT -94.34%,aPTT- 81%).Thrombocytopenia is found in 86% of population majority (50%) had counts less than 1 lac.
Conclusion: One or More hematological abnormality is noted in many Chronic Liver Disease(CLD) patients. Every CLD patient should be evaluated for hematological abnormalities and treated accordingly.

Introduction:-

Worldwide, the fourth most prevalent cause of mortality for adults is chronic liver disease, an advanced illness. The five years in CLD patients. When decompensation occurs in a clinic, the likelihood of it occurring (often ascites and jaundice) is 15-20%, while the 5-year survival rate for illnesses drops from 84 to 14-35%. The liver is crucial for healthy erythropoiesis, the production of clotting factors and inhibitors, and maintaining a stable hemostasis. The liver is also where the iron, vitamin B12, and folic acid needed for healthy hematopoiesis are stored.

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Hematological disorders are a frequent co-morbidity in CLD. Mostly Thrombocytopenia and neutropenia caused by hypersplenism, leucocytosis, and decreased production of clotting factors all contribute to normocytic normochromic anaemia, which is occasionally macrocytic in alcoholic coagulopathy.

Materials and Method:-

From November 2021 to November 2022 at Mysore Medical College and Hospital, Mysore, an observational study including CLD patients was done.

106 examples were chosen for the investigation. All of the included cases were checked for haematological abnormalities and CLD after being admitted to the ward.

When necessary, patients and their attendants provided oral and written consents in exchange for clinical evaluations, thorough personal and family histories, and numerous investigations for the study.

Investigation done:

To assess RBC abnormality: RBC count hemoglobin estimation PCV, MCV, MCHC, Peripheral smear of blood.
To asses WBC abnormality: Total and differential count of WBC. To assess hemostasis: Platelet count, PT, APTT Abdominal paracentesis Liver biopsy. Upper GIendoscopy

Inclusion Criteria:

Patients whose signs and symptoms of liver disease persist more than 6 months due to alcoholic, post-infective or metabolic cause.

Exclusion Criteria

1. Patients with known GIT malignancy or known primary hepato-cellular carcinoma.
2. Patients with primary coagulation disorder.
3. Acute liver failure

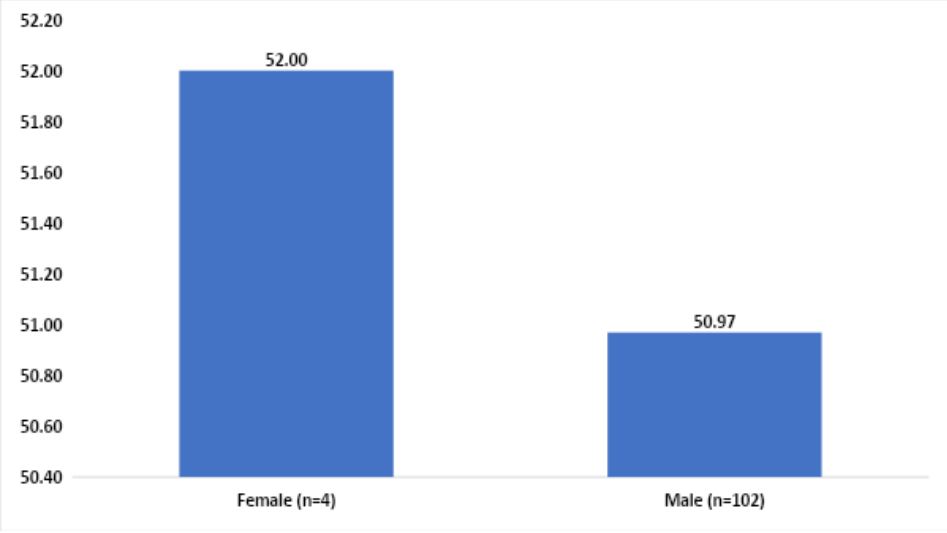
Ethical Approval:

Ethical approval was obtained from Mysore medical college and research institute Ethics Committee and the ethical protocols of the declaration of Helsinki (1967) including the ethical principles of informed consent, voluntary participation andwithdrawal, privacy and confidentiality, were followed.

Results:-

Hematological profile and hemostasis was conducted among 106 inpatients of medicine department at MMCRI,MYSORE.

Out of 106 patients, 102are male and 4 are female:



Out of 4 female, every one gave alcohol history and out of 102 male majority were alcoholic. Out of 102 male patients, 7 were chronic hepatitis B and 3 were hepatitis c positive.

Platelet and coagulation abnormalities

At our centre clotting factors can't be estimated. Platelet count, prothrombin time, international normalised ratio and activated partial thromboplastin time was estimated.

PT category	**Sex**		**Total**
	Female	Male	
Normal	1(25%)	5(4.9%)	6(5.66%)
Prolonged	3(75%)	97(95.1%)	100(94.34%)
Total	4(100%)	102(100%)	106(100%)
APTT Category	**Sex**		**Total**
	Female	Male	
Normal	0(0%)	25(24.51%)	25(23.58%)
Prolonged	4(100%)	77(75.49%)	81(76.42%)
Total	4(100%)	102(100%)	106(100%)

Discussion:-

Rbc Abnormalities

In this study, 102 patients were male and 4 were female most of the patients were in age group.Most common etiology for chronic liver disease was alcohol followed by chronic hepatitis 80% of patients were anaemic out of which 21% of patients were severely anaemic. A study by Rosario Gonzale Z – et al showed that anaemia in CLD patients were 75%. According to Sheila Sherlock of oxford text book of hepatology most common anaemia is normocytic normochromic. In our study most common anaemia observed was normocytic normochromic 48% ,26% have macrocytic, 28% had microcytic..

Anaemia in chronic liver disease is mostly due to:

1. Hemodilution
2. Decreased erythropoietin level as per the study sicilianohapatoy 1995 who showed decreased erythropoietin level in cirrhosis patients. Cirrhosis without anaemia is not associated with low erythropoietin levels.
3. Chronic inflammation in chronic liver disease leads to increased levels of inflammatory cytokines which suppresses the bone marrow.
4. Macrocytosis in chronic liver disease is mostly due to toxicity of Alcohol on bone marrow and deficiency of vitamin B12 and folic acid.
5. Microcytic anaemia is seen in patients who had bleeding from various Gastrointestinal sites.

Abnormalities of WBCs

In our study group of 106 patients, 32% patients had leukocytosis (>11,000 mm3) due to nosocomial infections, spontaneous bacterial peritonitis and secondary bacterial peritonitis. leucopenia present in 6% of patients due to :-

- Direct influence of alcohol on bone marrow.
- Chronic inflammatory cytokines having suppressor effect on bone marrow.
- Hypersplenism.
- Infection.

Platelet abnormalities and coagulopathy

According to interesting article by Tody L Kujovich MD – "Hemostatic defects in endstage liver disease", critical care clinics 21 (2005), mild to moderate thrombocytopenia occurs in 49 to 64% of patients with decompendated chronic liver disease (DCLD). Platelet count is rarely less than 30 to 40 thousands /mm3 In our study 48% patients had thrombocytopenia (<1.5 lakhs /mm2)

Causes of thrombocytopenia

1. Low thrombopoietin level
2. Hypersplenism.
3. Folate deficiency.
4. Alcohol induced bone marrow suppression.
5. DIC
6. Sepsis.

Escolar G et al reports that platelets aggregation to be particularly affected in 46% of patients of DCLD.

Possible mechanism include:

1. Reduced availability of arachidonic acid for prostaglandin synthesis.
2. Reduced platelet ATP and serotonin.
3. Increased FDP and D-dimers nitric oxide.
4. HDL isolated from cirrhotic patients that inhibit ADP induced plateletaggregation.
5. Platelet binding domains are abnormal thus preventing efficient binding toVon Willi Brand factor.

Coagulation abnormalities

A deranged coagulation system is universal in chronic liver disease due to reduced synthesis of coagulation factors (except factor VIII and Von willibrand factor), hyperfibrinolysis and dysfibrino-genemia. In our study 80% of patients have prolonged prothrombin time and 88% patients have prolonged APTT.

Conclusion:-

According to this study with sample size of 106,Most common etiology for chronic liver disease is alcohol followed by chronic hepatitis B.

Majority of subjects had anemia out of which,19.81% of subjects had severe anemia.Most common type of anemia observed was normocytic normochromic(45.28%).

32% of subjects had leucocytosis.while majority had normal leucocyte count.

81% of subjects had thrombocytopenia out of which 50% of subjects were having platelet count less than one lakh.

In our study 94% of subjects have prolonged prothrombin time and 76% of subjects were having prolonged APTT.

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