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Hematological Abnormalities in Chronic Liver Disease: A Retrospective Study in North Bihar

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Abstract
Chronic liver disease is an end stage disease and hematological abnormalities are common finding in it, adding morbidity to primary pathology and increase the mortality. The study was conducted to assess the hematological abnormalities and haemostatic derangements in CLD patients in north bihar to reduce the morbidity. Broadly, the hematological abnormities are viewed under abnormalities in RBCS, WBCS, platelets and coagulation profile.
Methods: *Total 50 patients who fulfilled our criteria were enrolled in our hospital, DMCH, Darbhanga. Patients were investigated after their oral and written consents wherever required.*
Results: *Various hematological abnormalities encountered were normocytic, Normo-chromic Anemia, Macrocytic mostly in alcholics, leukocytosis was more compared to leucopenia and thrombocytopenia, increased prothrombin time and APTT.*
Conclusion: *Every chronic liver disease patients must be evaluated for hematological abnormalities and should be treated accordingly as early possible.*
Keywords: *Chronic liver disease, hematological abnormalities, anaemia.*

Introduction

Chronic liver disease is an end stage disease and 4th most common cause of death in adults worldwide. In patients of CLD, the 5-years probability of decompensation (usually ascites and jaundice) is 15-20% while 5 years survival rate diseases from 84 to 14-35% once clinic decompensation developed. Liver plays an important role in normal erythropoiesis and synthesis of clotting factors and inhibitors and keeps the hemostasis in equilibrium. Liver is also site for storage of iron, vit B12 and folic acid necessary for normal hematopoiesis.

In CLD hematological abnormalities are common comborbidity. Mostly Normocytic normochromic anemia sometimes macrocytic in alcoholic coagulopathy is universal due to:

- Decreased synthesis of clotting factors and impaired clearance of anticoagulant.
- Thrombocytopenia and neutropenia due to hypersplenism leucocytosis more common than. Leucopoenia due to SBP and secondary peritonitis.

Aim of the study

1. To study the hematological abnormalities in CLD.
2. To find out the incidence and type of anemia in CLD.
3. To detect the abnormalities in RBCs, WBC in CLD.
4. To detect plated abnormalitics coagulopathy in CLD.

Materials & Methods

Observational study involving CLD patients was conducted at Darbhanga Medical College and Hospital, Darbhanga from March 2018 to February 2019.

50 cases were selected for the study. All the cases included were admitted in ward and evaluated for CLD and hematological abnormalities in them.

Oral and written consents were taken by patient and their attendants where required a detailed past, personal, family history, clinical examinations done and various Investigation done for the study.

Investigation done:

1. 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 GI endoscopy

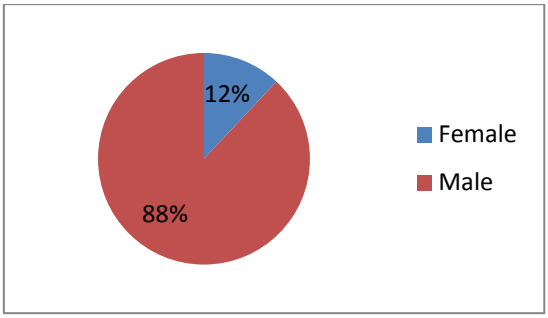
Inclusion Criteria: Patients whose signs and symptoms of liver disease persist more than 6 months due to alcoholic, post-infective or metabolic cause.

Exclusion Criteria

1. Patients with known GIT malignancy or known primary hepato-cellular carcinoma.
2. Patients with primary coagulation disorder.
3. Acute liver failure.
4. Liver cell failure due to septicemia or endotoxemia other than primary liver cause.

Data Analysis: Hematological profile and hemostasis was conducted among 50 inpatients of medicine department at DMCH, Darbhanga.

Out of 50 patients, 44 are male and 6 are female:



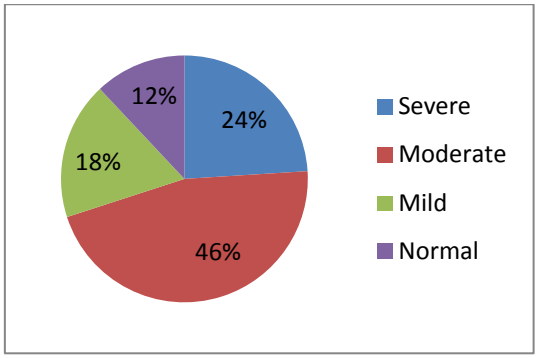
Age of patients

Age in yrs	Male	Female	Total	Percentage
20-30	2	0	2	4%
31-40	15	4	19	38%
41-50	22	1	23	46%
51-60	5	1	6	12%

Out of 6 female, no one gave alcohol history and out of 44 male 30 was alcoholic. Out of 44 male patients, 10 were chronic hepatitis B and out of 6 female patients 4 were chronic hepatitis B.

Analysis of RBCs: Out of 50 patients only 6 patients have normal hemoglobin.

Hemoglobin (gm/dl)	Male		Female	
	Number	Percentage	Number	Percentage
Severe (<6gm/dl)	10	22.7%	2	33.3%
Moderate (6-8.9g/dl)	20	45.45%	3	50%
Mild (9 to 12.9gm/dl)	8	18.18%	1 (<12gm/dl)	16.6%
Normal	6	13.6%	0	0%



Types of Anemia

Types of RBCs	Male		Female	
	Number	Percentage	Number	Percentage
Normocytic	23	52.2%	3	30%
Microcytic	13	29.54%	2	33.3%
Macrocytic	7	15.9%	1	16.6%
Dimorphic	1	2.3%	0	0%

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.

	Parameters	No. of cases	Percentage
1.	Platelet count		
	>1.5 lakhs/mm^3	26	52%
	1 – 1.5lakhs/mm^3	8	16%
	< 1 lakh/mm^3	16	32%
2.	Prothrombin time		
	Normal (9-12 sec)	9	18%
	Prolonged	41	82%
3.	APTT		
	Normal (26-36 sec)	6	12%
	Prolonged	44	88%

Discussion

Rbc Abnormalities

In this study, 44 patients were male and 6 were female most of the patients were in age group. 31-50 years. Most common etiology for chronic liver disease was alcohol followed by chronic hepatitis B.

88% of patients were anaemic out of which 24% 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 (52%) 16% have macrocytic, 30% had microcytic and 2% had dimorphic anaemia.

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 B_{12} and folic acid.
5. Microcytic anaemia is seen in patients who had bleeding from various Gastro-intestinal sites.

Abnormalities of WBCs

In our study group of 50 patients, 32% patients had leukocytosis (>11,000mm^3) 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 end stage 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 /mm^2)

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 platelet aggregation.
5. Platelet binding domains are abnormal thus preventing efficient binding to Von 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.

Conclusions

According to the study conduct with limited cases of 50 patients, we inferred many conclusive results regarding RBC abnormalities in CLD.

1) Most common anaemia is normocytic normochromic, microcytosisin patients having bleeding tendencics. macrocytic in alcoholic.
2) Leukocytosis more common than leukopenia.
3) Thrombocytopenia is common but prolonged PT and APTT in most of the patients.
4) All the CLD patients must be evaluated for hematological abnormalities for early correction to decrease the mortality.

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