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HAEMATOLOGICAL AND COAGULATION PROFILE IN LIVER CIRRHOSIS

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ABSTRACT

INTRODUCTION:

Liver is the largest organ in the body and of the most complex functioning organ with a wide array of function. Chronic liver disease in the clinical context is a disease process of liver that involves progressive destruction and regeneration of the liver parenchyma leading to fibrosis and cirrhosis. Chronic liver disease frequently associated with hematological abnormalities.

AIMS AND OBJECTIVES:

To assess the hematological and coagulation profile of patients with liver cirrhosis. OBJECTIVES:

1. *To assess haematological profile of patients with liver cirrhosis.*
2. *To assess coagulation profile of patients with liver cirrhosis.*

METHODS:

By using automated cell counter haematological parameters like Hb, RBC, WBC, PLT, MCV, MCH, MCHC and RDW were done. The coagulation profile including PT, APTT were performed using automated Erba analyzer and the results were evaluated.
Analyses yet to be done.

RESULTS:

Out of 75 cases of liver cirrhosis group males were predominant while in 75 cases of control group both male and female (40 males and 35 females) were present. The mean age was 50.8 ± 11.7 (cases), 55.9± 10.3 (controls). Present study showed MCV was higher in case group compared to control group showing MCV 86.9 ± 16.0 in case group and 85.7± 3.0 in control group. Mean WBC in case group was 7095.0 ± 3715.8 and in control group was 7226.1 ± 1751.2. Higher incidence of normocytic normochromic anaemia and mild to moderate thrombocytopenia is observed. Mean Prothrombin time was 18.7± 3.1 (case group), 14.0± 1.5 (controls). Mean Activated
partial thromboplastin time was 42.0± 5.5 (cases), 35.4± 2.7 (controls). Prothrombin time is also prolonged in our study.

CONCLUSION:

This study reveals various coagulation and haematological abnormalities which vary with different liver diseases, duration and severity of disorders. These changes need to be identified and corrected early to reduce morbidity and mortality.

KEY WORDS:

Haematological profile, coagulation profile, Liver cirrhosis.

INTRODUCTION

Cirrhosis is the final stage of chronic liver disease which is known to be associated with number of hematological complications especially thrombocytopenia and coagulation disorders.[1]

Hepatic cirrhosis can occur at any age and often causes prolonged morbidity. It frequently manifests itself in younger adults and is an important cause of premature death.

Abnormalities in hematological parameters are associated with an increased risk of[2]

complications including bleeding and infection.

Prothrombin time correlates well with severity of hepatocellular damage as well as with the occurrence of abnormal bleeding and the overall prognosis.[2]

The liver is the cornerstone of the coagulation system. The physiology of blood coagulation is closely linked to liver function as the liver synthesizes most of the factors of the coagulation cascade and fibrinolytic proteins.[3]

The liver plays a major role in carbohydrate, protein, lipid metabolism, inactivation of various toxins, metabolism of drugs, hormones, synthesis of plasma proteins and maintenance of immunity.

Impaired hemostasis resulting from abnormal liver function in liver disease are usually measured by the prolongation of global screening tests such as the prothrombin time (PT) and the activated partial thromboplastin time (aPTT).

Many studies have observed that significant prolongation of PT and aPTT in the absence of significant hypofibrinogenemia suggests their importance as reliable biological markers of coagulopathies in liver diseased patients.

Hence this study was conducted to assess the haematological changes and coagulation abnormalities so that treatment can be initiated towards reducing the morbidity and mortality.

AIM :

To assess the hematological and coagulation profile of patients with liver cirrhosis.

OBJECTIVES:

1.To assess haematological profile of patients with liver cirrhosis. 2.To assess coagulation profile of patients with liver cirrhosis.

MATERIALS AND METHODS

The study was conducted in the laboratory of pathology department. This study included 75 case group and 75 normal control group patients.
The coagulation tests Prothrombin time and Activated partial thromboplastin time were performed and the results were evaluated in groups.

By using automated sysmex six part cell count analyzer haematological parameters like Hb, RBC, WBC, Platelet, MCV, MCH, MCHC and RDW were done.

INCLUSION CRITERIA

All confirmed cases of cirrhosis(by clinical, biochemical, radiological and prior biopsy.

Both sexes with patients age ranging from 30 to 70 years and irrespective of socioeconomic status were included.

EXCLUSION CRITERIA:

Patients of cirrhosis with previous history of coagulation disorders or who took any of the following drugs in the previous week were excluded: aspirin or non steroidal anti-inflammatory drugs, antihistaminics, penicillin, thiazides, sulfonamides, beta blockers and anticoagulants.

STATISTICAL ANALYSIS

Data entry was done in excel spread sheet. Data cleaning, validation and analysis was done using SPSS (version-20).

RESULTS

Table 1: Comparison of CBC parameters between cases and controls

Group	Cases	Control	t-value	P-value
Age	50.8±11.7	55.9±10.3	-2.852	0.005
Hb g/dl	9.6±2.0	14.2±0.8	-18.741	<0.001
HCT %	28.2±6.1	33.3±3.1	-6.408	<0.001
RBCm/mm3	3.2±0.8	4.2±0.3	-10.094	<0.001
MCV fl	86.9±16.0	85.7±3.0	0.655	0.513
MCH pg	31.2±3.8	29.2±2.1	4.103	<0.001
MCHCg/dl	34.5±1.2	34.1±1.2	1.967	0.051
PLT mcL	142067.6±82066.5	251013.3±90245.1	-7.706	<0.001
WBCmicrl	7095.0±3715.8	7226.1±1751.2	-0.276	0.783
Neutrophil	72.2±9.8	67.1±4.5	4.099	<0.001
Lymphocyte	20.8±8.7	27.7±4.6	-6.075	<0.001
Esinophil	2.5±1.4	3.5±1.2	-4.889	<0.001
Monocyte	4.7±1.4	1.7±0.9	16.010	<0.001

** Independent Sample t-test, Statistically significant if P<0.05*

Table : Comparison of PT, INR and APTT between cases and controls

	Cases	Control	t-value	P-value
PT sec	18.7±3.1	14.0±1.5	11.668	<0.001
INR sec	1.7±2.6	0.9±0.1	2.611	0.010
APTT	42.0±5.5	35.4±2.7	9.328	<0.001

** Independent Sample t-test, Statistically significant if P<0.05*

The age of chronic liver patients ranged between 35-85 years. Out of 75 cases of liver cirrhosis group males were predominant while in 75 cases of control group both male and female (40 males and 35 females) were present. The mean age was 50.8 ± 11.7 (cases), 55.9± 10.3 (controls).

Present study showed MCV was higher in case group compared to control group showing MCV 86.9 ± 16.0 in case group and 85.7± 3.0 in control group. Normocytic normochromic anemia was common in both case and control group.

In the present study mean WBC in case group was 7095.0 ± 3715.8 and in control group was 7226.1 ± 1751.2 and mean platelet count was 142067.6 ± 82066.5 (cases), 251013.3 ± 90245.1 (controls). We observed leukocytosis and mild to moderate thrombocytopenia.

Mean Prothrombin time was 18.7± 3.1 (case group), 14.0± 1.5 (controls). Mean Activated partial thromboplastin time was 42.0± 5.5 (cases), 35.4± 2.7 (controls).

Prothrombin time is prolonged in our study.

DISCUSSION

Liver cirrhosis is the final stage of chronic liver disease which is known to be associated with number of hematological complications especially thrombocytopenia and coagulation disorders.

Abnormalities in hematological parameters are associated with an increased risk of complications including bleeding and infection.

Present study showed out of 75 cases of liver cirrhosis group males were

predominant while in 75 cases of control group both male and female (40 males and 35 females) were present.

The study was in concordance with study done by Khare et al [4]. His study showed males were predominant with72%.

The patients presented with complaints such as jaundice, fever, anorexia, fatigue and weight loss.

In the present study mean age was 50.8± 11.7 (cases), 55.9± 10.3 (controls). It was similar to the study done by Om K Pathak et al [5].

In the present study Mean haemoglobin was 9.6 ± 2.0 (cases) and 14.2 ±0.8 (controls). It is similar to the study done by Halleys kumar 2014 [6] showed in case group haemoglobin was <9.0g/dl.

Present study showed MCV was higher in case group compared to control group showing MCV 86.9 ± 16.0 in case group and 85.7± 3.0 in control group. Similar results were seen in study by Ozgur etal [7].

Normocytic normochromic anemia was common in both case and control group in the present study [8] and it was in concordance with the study done by Malhotra etal and Bhatia et al [9] showed higher incidence of Normocytic normochromic anaemia.

In the present study mean WBC in case group was 7095.0 ± 3715.8 and in control group was 7226.1 ± 1751.2.

It was similar to the study done by Sudhir et al 201010. He observed leukocytosis showing more than 11,000 with neutrophilia.

Present study showed Mean platelet count was 142067.6 ± 82066.5 (cases), 251013.3 ± 90245.1 (controls). We observed mild to moderate thrombocytopenia which was in concordance with the study done by Tody et al 2005 [10] where he showed 65% of patients with mild to moderate thrombocytopenia less than 1.5 lakhs/mm^2.

Thrombocytopenia is mainly due to portal hypertension associated with splenic sequestration, alteration in thrombopoetin, bone marrow suppression, consumptive coagulopathy.

In the present study Mean Prothrombin time was 18.7± 3.1 (case group), 14.0± 1.5 (controls). Mean Activated partial thromboplastin time was 42.0± 5.5 (cases), 35.4± (controls).

Prothrombin time is prolonged in our study which was in agreement with the results of Saatea et al[11] where he showed 72.5 % of cirrhotic patients showed prolonged Prothrombin time showing 12.5± 1.03 seconds and Activated partial thromboplastin time showing 45.39± 4.4seconds.

CONCLUSION

This study reveals various coagulation and haematological abnormalities which vary with different liver diseases, duration and severity of disorders.

These changes need to be identified and corrected early to reduce morbidity and mortality.

Long term excessive alcohol consumption leads to liver cirrhosis which interferes with various physiological, biochemical and metabolic processes involving the blood cell production and maturation leading to these adverse effects.

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