



## General Medicine

## STUDY OF CORRELATION BETWEEN ESOPHAGEAL VARICES IN UPPER GI ENDOSCOPY WITH SEVERITY OF LIVER DISEASE USING CHILD PUGH SCORE AND MELD SCORE IN PATIENTS WITH CIRRHOSIS OF LIVER.

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### KEYWORDS :

#### INTRODUCTION

Chronic liver disease common medical condition in medical wards due to varied range of manifestations. Cirrhosis is chronic inflammation of liver associated with advanced fibrosis and distortion of hepatic parenchyma. These patients may present with spectrum of symptoms like jaundice, ascites, symptoms pertaining to hepatic encephalopathy, hepatorenal syndrome, variceal hemorrhage<sup>1</sup> and evidence of portal hypertension<sup>1</sup>.

Disturbed Coagulation is known complication in cirrhotic patients due to causes like thrombocytopenia, deficiency of clotting factors, bone marrow suppression, vitamin B12 deficiency and they have tendency to develop increased risk of life threatening bleeding risk mainly esophageal varices<sup>2</sup>, bleeding hemorrhoids and also severe anemia. Splanchnic vasodilatation and increase splanchnic blood flow in these patients can cause portal hypertension, which is also caused by increased resistance blood flow in cirrhotic liver<sup>2</sup>. It carries a high risk of mortality upto 30%<sup>3</sup>. Variceal bleeding is a major life threatening complication of portal hypertension.

Liver plays crucial role is clotting mechanism indirectly by synthesis of procoagulant and also anticoagulant factors and hence participating in clotting mechanism<sup>4</sup>. Any type of liver injury acute or chronic can give rise to bleeding tendencies in these patients and life threatening complications.

Coagulation abnormalities in chronic liver disease are identified based on assessment of routine coagulation parameters such as Prothrombin Time (PT), International normalized ratio (INR), the activated Partial Thromboplastin Time (APTT), and platelet count<sup>5</sup>. Identification of specific biochemical markers that can predict the severity of liver cirrhosis and the probability of bleeding tendency can help the physician in early detection of complications<sup>6</sup>.

MELD scoring and Child's PUGH score are commonly used in patients with liver cirrhosis to assess the severity of disease. Since there is limited data regarding the correlation of hematological and hemorrhagic parameters with Child's PUGH score and MELD score in patients with liver cirrhosis, this study is aimed to find the correlation between esophageal varices with upper GI endoscopy, clinical symptoms and platelet count with severity of liver disease using Child PUGH score and MELD score in patients of liver cirrhosis and portal hypertension.

#### MATERIALS AND METHOD:

This was a cross-sectional study and the study group included 100 patients diagnosed to have cirrhosis of liver with portal hypertension admitted at RajaRajeswari Medical College and Hospital. Ethical clearance for the study was obtained from the Institutional Review Ethical committee.

#### AIMS AND OBJECTIVES:

1. Frequency of upper GI bleed in study patients
2. Correlation between Upper GI endoscopy with child's grade.
3. Relation between Upper GI bleed with MELD score

Patients with age group between 18-80 years with clinical,

biochemical or ultrasound findings suggestive of liver cirrhosis with portal hypertension were included in this study. Patients with CHF, chronic renal failure, diabetes mellitus, sepsis, malignancy, hypertension, patients on anticoagulants, antiplatelets, patients with history of bleeding within one month, known coagulation disorders were excluded from study.

The study group patients were categorized based on Child's PUGH score, MELD score and upper GI endoscopy grades as follows: In Child's PUGH score<sup>7</sup>, the severity of liver disease was measured with scoring system based on total bilirubin, serum albumin, PT, Ascites and hepatic encephalopathy as 3 groups:

Class A: Total score 5 or 6

Class B: Total score 7-9

Class C: Total score 10 or higher

In MELD score, the severity of liver disease was validated from laboratory values of serum bilirubin, serum creatinine and INR for prothrombin time to predict three-month survival as two groups:

MELD<20

MELD>20

Esophageal varices were graded as absent, grade 1, 2 and 3 according to de Franchis et al<sup>8</sup> as follows:

Grade 1: Esophageal varices occupied less than a third of the lumen and flatten with air insufflation.

Grade 2: Esophageal varices occupied less than a third and did not flatten with air insufflation.

Grade 3: Esophageal varices occupied at least a third of the lumen and did not flatten with air insufflation.

A detailed history and clinical examination of the study group patients were performed. Patients were evaluated for bleeding symptoms. Symptoms suggestive of bleeding was defined by history of hematemesis/ melena /hematochezia or positive fecal occult blood or bleed seen on upper gastrointestinal endoscopy (indicated by oozing of blood/active bleed/clots in esophagus, stomach or duodenum).

Patients assessed with demographic data (age, gender), routine biochemical (serum bilirubin, serum albumin, serum creatinine, coagulation profile and INR), and hematologic (platelet count) parameters in all patients.

The blood was collected and plasma stored in deep freeze to assess full coagulation profile. Prothrombin Time was measured using STA-NEOPLASTINE® CI Plus kit. The activated partial thromboplastin time (APTT) was calculated using STA® C.K. CREST® 5. The plasma fibrinogen was measured using STAFIB 2 kit. About 5 mL of blood was drawn for the determination of fibrinogen and other biochemical tests. INR was calculated using the raising prothrombin time ratio (PT INR) which is the ratio of plasma level of PT and the mean normal PT to the power of the international sensitivity index.

Mean values of PT, APTT, fibrinogen and platelet count and hematological variables were calculated and correlated with different categories of CP classes and MELD score. Mean PT, APTT, fibrinogen and platelets were also compared with Upper GI scopy findings.

**Statistical analysis**

The association between coagulation profile and several variables were tested using SPSS (Statistical Package for Social Sciences) version 20. The level of significance was set at 5%. The comparison of coagulation parameters and hematological parameters with Child Pugh score, MELD score and UGI findings were done by Chi square test. The comparison of clinical symptoms with Child Pugh score were done by Chi square test

**RESULTS:**

In our study on 100 patients with cirrhosis of liver, majority of patients were in age group between 51-60 years (44%), 34% patients between 41-50 years, 22% were in age group 31-40 years (table 1).

**Table 1**

Age groups	Frequency	Percent
30 to 40 yrs	22	22.0
41 to 50 yrs	34	34.0
51 to 60 yrs	44	44.0
Total	100	100.0

In our study we observed out of 100 patients, Ascites was present in 78 patients, Jaundice was present in 83 patients, fatigue was present in 60 patients and odema in 63 patients. Abdominal Pain in 43% patients, and bleeding 28% patients. Ascites, odema, bleeding, dyspnoea and fatigue showed statistically significant difference between Child's Pugh groups (Table 2).

**Table 2**

		CHILDS GRADE			Total	p value
		A	B	C		
ASCITES	NO	12	10	0	22	0.001*
	YES	13	39	26	78	
JAUNDICE	NO	6	8	3	17	0.48
	YES	19	41	23	83	
ODEMA	NO	19	16	2	37	0.001*
	YES	6	33	24	63	
BLEEDING	NO	21	39	12	72	0.003*
	YES	4	10	14	28	
PAIN	NO	14	33	10	57	0.055
	YES	11	16	16	43	
FATIGUE	NO	15	19	6	40	0.026*
	YES	10	30	20	60	

\*significant

In our study, patients were categorized into Child's grading A, B, C. 32 patients were under grade A, 42 patients were under grade B and 26 patients were under grade C. In our study, 47 patients had MELD score <20 and 53 patients had MELD score >20. (Table 2)

In our study out of 100 patients, in 57 patients we found evidence of esophageal varices of different grades. We found among 57 patients, 34 patients had grade 1, 17 patients had grade 2 and 6 patients had grade 3 and 43 patients did not have evidence of esophageal varices. (Table 3).

**Table 3**

	CHILDS GRADE	N	Mean	p value
Child's Grade	A	32	11.53	0.003*
	B	42	12.42	
	C	26	13.18	
MELD Score	< 20	47	11.81	0.007*5
	> 20	53	12.80	
UGI	Grade 1	34	12.51	0.311
	Grade 2	17	12.39	
	Grade 3	6	13.42	
	Normal	43	12.02	

\*significant

In our study we found out of 100 patients, 34 had grade 1 varices among them 10 belong to child A, 17 belonged to grade B and 7 cases

were grade C. 17 Patients with grade 2 varices, 1 belonged to Child A, 10 belonged to Child B, 6 were Child C grade. We observed total of among 6 patients with grade 3 varices 1 was in Child A, 3 belonged Child B and 2 belonged to Child C. However the correlation of varices with Child Pugh grade was not significant (Table 4).

The correlation of coagulation parameters with Child's Pugh grade, patients with cirrhosis of liver with portal hypertension were mentioned in Table 3. In our study, the Prothrombin time was >20 for 62 patients and <20 for 38 patients. APTT value was < 45 for 50 patients and >45 for 50 patients. Fibrinogen was <200 for 56 patients and >200 for 44 patients. The platelet count was <50k for 4 patients, 50k to 1 L for 37 patients, 1 L to 1.5 L for 22 patients and >1.5L for 37 patients. Over all hematological abnormalities have positive correlation and statistically significant relation with Child Pugh score (Table 4).

**Table 4**

Coagulation parameters		CHILDS GRADE			Total	p value
		A	B	C		
PT	≥ 20	5	31	26	62	0.001*
	< 20	27	11	0	38	
APTT	< 45	27	21	2	50	0.001*
	> 45	5	26	25	56	
Fibrinogen	< 200	5	26	25	56	0.001*
	> 200	27	16	1	44	
Platelets	< 50 k	0	1	3	4	0.001*
	50 k to 1 L	4	17	16	37	
	1 L to 1.5 L	9	10	3	22	
	> 1.5 L	19	14	4	37	
UGI	GRADE 1	10	17	7	34	0.066
	GRADE 2	1	10	6	17	
	GRADE 3	1	3	2	6	
	NORMAL	20	12	11	43	

\*significant

The correlation of coagulation parameters with MELD score of patients with liver cirrhosis and portal hypertension mentioned in table 4. The PT, APTT, Fibrinogen and platelet count showed statistically significant difference between the MELD score groups. Out of 100 patients 57 patients had endoscopic evidence of esophageal varices. Out of 34 patients with grade 1 varices, 17 patients had MELD score of >20. Among 17 patients with grade 2 varices, 14 patients had MELD score of >20. Among 6 Patients with grade 3 varices, 4 patients had MELD score of >20. The correlation between elevated MELD score with varices of different grades was statistical significant and positive correlation (Table 5).

**Table 5**

Coagulation parameters		MELD SCORE		Total	p value
		< 20	>20		
PT	≥ 20	11	51	62	0.001*
	< 20	36	2	38	
APTT	< 45	42	8	50	0.001*
	> 45	5	45	50	
Fibrinogen	< 200	7	49	56	0.001*
	> 200	40	4	44	
Platelets	< 50 k	0	4	4	0.001*
	50 k to 1 L	4	33	37	
	1 L to 1.5 L	16	6	22	
	> 1.5 L	27	10	37	
UGI	GRADE 1	17	17	34	0.035*
	GRADE 2	3	14	17	
	GRADE 3	2	4	6	
	NORMAL	25	18	43	

\*significant

**DISCUSSION:**

We conducted study on 100 patients diagnosed with cirrhosis of liver with portal hypertension.

In our study, there was significant association between the coagulation parameters, Child's Pugh scores and MELD scores. Abnormal coagulation indices such as prolonged PT, APTT were directly proportional to the severity of liver disease and statistically significant. In current study along with routine coagulation indices, specific markers like serum fibrinogen and platelets were also assessed (Table 4, 5). There was a significant decrease in serum fibrinogen and platelet count with the increase in disease severity. These findings were statistically significant. This is in accordance with study by Pahwa et al<sup>11</sup> in which they calculated mean PT and APTT values and compared with CP score and MELD score. They also found mean PT and APTT values increased from Child Pugh class A to C and APTT between B and C. They also found worsening of mean PT and APTT with increase

on MELD score. The results of present study were similar to study by Pahwa et al<sup>11</sup>.

In our study we didn't find significant association of upper GI endoscopy finding with Child's Pugh scores. This is similar with other studies by Chalasani et al<sup>12</sup>, Benedeto et al<sup>13</sup> and Flores et al<sup>14</sup>. However we observed there was significant association of upper GI endoscopy finding with MELD scores which showed that the severity of esophageal varices is directly proportional to severity of liver disease in accordance with higher MELD scores.

In our study, there was strong association between the platelet count with upper GI endoscopy findings., there was decrease in platelet count with increase in severity of esophageal varices (Table 5). Hence, patients with thrombocytopenia were at higher risk of developing esophageal varices which is in accordance with study by Giannini et al<sup>15</sup> and Schepis et al<sup>16</sup>.

## CONCLUSION:

In our study we found there was no significant correlation between the upper GI endoscopy findings and Child's Pugh scores but we found definite significant and positive correlation between esophageal varices and high MELD score. The coagulation indices such as PT, APTT, fibrinogen and platelet count showed statistically significant differences between the MELD scores and this implicates that the coagulation values decrease with higher grades of severity of liver disease based on MELD scores. This study concludes that its not the single parameter which tells us about the clinical severity of these patients but the overall vigilance and correlation of hematological parameters with upper GI findings guides us the need for the detail evaluation is utmost needed for the effective management of patients in improving the prognosis and prevention of morbidity in these patients.

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