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Original Research Article

TO EVALUATE VARIOUS CLINICAL, BIOCHEMICAL AND RADIOLOGICAL PARAMETERS IN PREDICTING THE PRESENCE OF LARGE ESOPHAGEAL VARICES.

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Abstract

Background & Methods: The aim of the study is to evaluate various clinical and biochemical parameters in predicting the presence of large esophageal varices. The study included indoor patients diagnosed with chronic liver disease based on clinical, biochemical and radiological findings. All the patients were screened for esophageal varices by means of upper GI endoscopy.

Results: Almost 90% of study participants were anemic, out of them 31% were mildly anemic, 51.1% moderately anemic and only 4.3% were found to be severely anemic. Mean Hb level of study participants was 8.96gm. 28.7% participants were having thrombocytopenia and 53.2% participants were having raised prothrombin time. Serum bilirubin level was found raised in 47.9% of CLD patients. Spleen size and portal vein size above the normal range was found in 63.8% and 53.2% of participants respectively.

Conclusion: The clinical and biochemical parameters found to have predictive value in large esophageal varices are splenomegaly and low platelet count. However other parameters like jaundice, ascites, hepatic encephalopathy, serum bilirubin, PT/INR and Child-Turcotte-Pugh score failed to show independent predictive value. The ultrasonographic parameter found to have predictive value in large esophageal varices are increased splenic diameter and portal vein diameter.

Keywords: clinical, predicting, esophageal & varices.
Study Design: Observational Study.

1. Introduction

Liver diseases are a leading cause of morbidity and mortality all over the world. It is the 11th leading cause of death and 15th leading cause of morbidity, accounting for 2.2% of deaths and 1.5% of disability adjusted life years worldwide in 2016[1].

The burden of liver disease in India is significant because it alone contributes 18.3% of the two million global liver disease related death in 2015.The contribution of cirrhosis and

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its complications, collectively chronic liver disease as causes of mortality in India have been progressively increasing since 1980[2].

The natural history of chronic liver disease is characterised by a long asymptomatic and compensated phase. During this phase, fibrosis progresses leading to cirrhosis. Liver cirrhosis is the final evaluative stage of any chronic liver disease, resulting in the formation of fibrous tissue, disorganization of liver architecture and nodule formation, which interferes with liver function and results in portal hypertension[3].

The three primary complications of portal hypertension are gastroesophageal varices, ascites and splenomegaly. Esophageal varices develop in the context of increased portal blood pressure owing to increase portal vascular resistance. Esophageal varices are dangerous clinical consequences of liver cirrhosis. Prevalence of varices increases with the severity of liver disease. The incidence of esophageal varices in cirrhotic patients is around 5% at the end of one year and 28% at the end of three years. Small varices progress to large ones at a rate of 10% to 12% annually[4]. The size of esophageal varices is directly proportional to the risk of variceal rupture and bleeding. The annual risk of variceal bleeding among small and large varices is 5% and 15% respectively[4]. The six week mortality rate following index variceal bleeding is approximately 20%[5].

2. Material and Methods

The study include patients admitted in JAH Group of Hospitals confirmed to have chronic liver disease was enrolled in study was carried out in the Department of Medicine in J.A. Group of Hospitals, Gwalior on an inpatient basis from January 2021 to August 2022. Patients were asked to sign a well written informed consent prior to enrollment. The study was a hospital based observational study which included indoor patients diagnosed as chronic liver disease based on clinical, biochemical and radiological findings. All the patients were screened for esophageal varices by means of upper GI endoscopy.

Inclusion criteria:

- Age more than 18 years.
- Chronic Liver disease with portal hypertension

Exclusion criteria:

- Age below 18 years.
- Cases of

- Active gastrointestinal bleeding
- Primary hematologic disorders

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3. Result

Table 1: Demographic distribution of study participants

Age Group	Frequency	Percent
<20 year	2	2.1
20-29 year	1	1.1
30-39 year	28	29.8
40-49 year	34	36.2
50-59 year	19	20.2
≥60 year	10	10.6
Age (Mean ± SD)	45.01±10.15	
Female	25	26.6
Male	69	73.4
Total	94	100%

Mean age of study participants in the study was 45.01 year, only 3.2% of participants belongs to below the age of 30 year. More than 85% of participants belongs to 30 to 59 year age group and only 10.6% enrolled participants belongs to ≥ 60 year age. Almost 2/3rd of participants was male in the study.

Table 2: Investigations

Symptoms		Frequency	Percent
Hemoglobin	<7 gm (severe)	4	4.3
	7-10 gm (moderate)	48	51.1
	10-13 gm (mild)	31	33.0
	>13 gm (normal)	11	11.7
	Mean ± SD	8.96±1.56	
Platelet count	<1 Lac (below normal)	27	28.7
	≥1 lac (normal)	67	71.3
Serum bilirubin	<0.1 mg/dl (below normal)	0	0.0
	0.1-1.3 mg/dl (normal)	49	52.1
	>1.3 mg/dl (above normal)	45	47.9
	Mean ± SD	2.73±3.16	
Prothrombin time	<11 Sec (below normal)	0	0.0
	11-14 Sec (normal)	44	46.8
	>14 Sec (above normal)	50	53.2
	Mean ± SD	15.46±4.80	
Spleen Size	≤12 cm (below normal)	34	36.2
	>12 (above normal)	60	63.8
	Mean ± SD	12.57±2.31	
Portal Vein Size	<07 cm (below normal)	0	0.0
	07-13 cm (Normal)	44	46.8

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	>13 cm (above normal)	50	53.2
	Mean ± SD	13.53±3.15	

Almost 90% of study participants were anemic out of them 31% were mild anemic, 51.1% moderately anemic and only 4.3% were found severely anemic. Mean Hb level of study participants was 8.96gm. 28.7% participants were having thrombocytopenia and 53.2% participants were having raised prothrombin time. Serum bilirubin level was found raised in 47.9% of CLD patients. Spleen size and portal vein size above the normal range were found in 63.8% and 53.2% of participants respectively.

Table 3: CTP Score

CTP Score	Frequency	Percent
A	22	23.4
B	28	29.8
C	44	46.8
Total	94	100.0

CTP class wise distribution of participants: 23.4%, 29.8% and 46.8% of participants belonged to Class A, B and C respectively.

Table 4: Multivariate analysis of esophageal varices endoscopic findings with dependent variables

Variables	Understandarized coefficients	95% confidence interval for B		t	sig
		Lower bound	Upper bound		
Hb%	-0.029	-0.064	0.007	-1.590	0.116
Platelet count	4.268	0.000	0.000	-6.080	0.000
S. Bilirubin	-0.005	-0.027	0.017	-0.433	0.666
PT	-0.003	-0.017	0.012	-0.344	0.732
Spleen Size	-0.092	-0.133	-0.050	-4.348	0.000
Portal vein size	-0.078	-0.111	-0.045	-4.733	0.000

The table shows on multivariate analysis platelet count, spleen size and portal vein diameter found to be statistically significant.

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Table 5: Association of esophageal varices size with etiology and sign of chronic liver diseases

		Large	Small	Normal	p value
Etiology	Alcohol	20 (44.4%)	14 (66.7%)	15 (53.6%)	0.662
	Hepatitis B	9 (20%)	2 (9.5%)	4 (14.3%)	
	Hepatitis C	3 (6.7%)	0 (0%)	1 (3.6%)	
	Others	13 (28.9%0	5 (23.8%)	8 (28.6%)	
Ascites	Mild	0 (0%)	10 (47.6%)	9 (32.1%)	<0.001
	Moderate	21 (46.7)	8 (38.1%)	6 (21.4%)	
	Massive	24 (53.3%)	2 (9.5%)	1 (3.6%)	
	None	0 (0%)	1 (4.8%)	12 (42.9%)	
Encephalopathy	No	33 (73.3%)	21 (100%)	28 (100%)	0.001
	Yes	12 (26.7%)	0 (0%)	0 (0%)	
CTP Score	A	0 (0%)	3 (14.3%)	19 (67.9%)	<0.001
	B	1 (2.2%)	18 (85.7%)	9 (32.1%)	
	C	44 (97.8%)	0 (0%)	0 (0%)	

Except etiology of Liver Cirrhosis other parameters like Ascites, encephalopathy and CTP Score was found significantly associated with size of esophageal varices. Massive Ascites (53.3%), encephalopathy (26.7%) and C class of CTP Score (97.8%) was found significantly higher with large size esophageal varices.

Table 6: Association of esophageal varices size with laboratory findings of chronic liver diseases

Variable	Large	Small	Normal	p value
Age	45.69±9.14	44.52±12.54	44.29±10.04	0.825
Hb	9.16±1.43	9.08±1.94	8.53±1.43	0.218
Platelet count	99315.56± 7516.95	168057.14± 46371.56	280785.71± 44909.72	<0.001
S. Bilirubin	4.5±3.58	1.14±0.83	1.07±1.68	<0.001
PT	18.05±5.67	13.33±2.01	12.89±1.59	<0.001
Spleen size	14.34±1.53	12.53±0.76	9.76±0.85	<0.001
Portal vein size	16.26±1.99	12.37±0.7	10.03±1.08	<0.001

Age and Hemoglobin was not found associated with size of esophageal varices. Mean Platelet count, Serum Bilirubin, Prothrombin time, Spleen Size and Portal vein size was found statistically different between size of esophageal varices. Patients with low platelet count, raised serum bilirubin, raised prothrombin time, enlarged spleen size and portal vein size were having large esophageal varices.

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4. Discussion

The number of patients with cirrhosis and portal hypertension are on increasing trend because of modern lifestyle. The need for noninvasive prediction of large esophageal varices in advanced chronic liver disease and cirrhosis patients in rural areas may be helpful in early referral and detection[6].

Most of the studies regarding the noninvasive diagnosis of esophageal varices, found decreased platelet count and splenomegaly as the noninvasive predictors of the presence of esophageal varices. In this study, only simple, commonly available, feasible and reproducible parameters were considered.

In this study, data was obtained from 94 patients with portal hypertension including 45 with large esophageal varices.73.4% were males and 26.6% were females with mean age 45.01 years[7]. Alcohol was found as the most common etiology for chronic liver disease among study participants.

On univariate analysis, eight factors had predictive ability for the presence of large esophageal varices[8]. The parameters found statistically significant in univariate analysis are ascites, hepatic encephalopathy, Child- Turcotte -Pugh score, low platelet count, serum bilirubin, PT/INR, spleen diameter and portal vein size (p value-<0.001). However on multivariate analysis, low platelet count, splenomegaly and portal vein diameter were found to have independent predictive value (p value-<0.001).

Variceal bleeding is a serious complication of portal hypertension associated with significant morbidity and mortality. This complication is more common in patients with large esophageal varices and is uncommon in those with small esophageal varices[9]. As the occurrence of variceal bleeding can be prevented with pharmacological agents like beta adrenergic receptor antagonists, it is important to recognize patients who have large esophageal varices. The patients with portal hypertension and increased risk of bleeding should be screened routinely and at periodic intervals thereafter throughout life. But this imposes a major burden on endoscopy units and significant cost on patients[10].

In multivariate linear regression analysis only three parameters found to have independent predictive value in this study were enlarged spleen, low platelet count and portal vein size (p value <0.001). Same predictors have been most consistently identified predictors in other previous studies also. Thus the results of this study are consistent with those of previous studies.

5. Conclusion

The clinical and biochemical parameters found to have predictive value in large esophageal varices are splenomegaly and low platelet count. However other parameters like jaundice, ascites, hepatic encephalopathy, serum bilirubin, PT/INR and Child-Turcotte-Pugh score failed to show independent predictive value. The ultrasonographic parameter found to have predictive value in large esophageal varices are increased splenic diameter and portal vein diameter.

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