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STUDY OF NON-INVASIVE PREDICTORS OF OESOPHAGEAL VARICES IN TERTIARY CARE CENTER

Internal Medicine

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ABSTRACT

Introduction: The development of oesophageal varices and gastrointestinal bleeding is serious complication in people with portal hypertension. Annual incidence of gastrointestinal bleeding is only 1-2 percent in patients without varices, 5% in patients with minor oesophageal varices, and 15% in patients with big oesophageal varices. **Aim:** To study the incidence and evaluate various Non-invasive (clinical, biochemical and ultrasonographic) parameters in predicting the presence of large esophageal varices in patients with liver disease. Materials and methods: A prospective observational study was conducted over 18 months from February 2020 to August 2021 on 50 known cases of liver disease with portal hypertension , attending the tertiary care hospital. All relevant non-invasive data like CBC, detailed LFT, PT-INR, ascitic fluid study and usg was collected.Upper gastrointestinal endoscopy was done in all patient to look for presence of varices and their size.Results: In the our study out of 50 participants 24(48%) patients had large oesophageal varices,17(34%) had small and 9(18%) had no varices. In this study, Median WBC count, Median platelet count and median serum bilirubin level in small varices group were 7050 cells/mm3, 194000 cells/mm3 and 0.83mg/dl respectively while in large varices group it were 4550 cells/mm3, 111000 cells/mm3 and 2.55mg/dl respectively with p value 0.025,0.002 and 0.003 respectively. Median spleen size , Median portal vein diameter and platelets/spleen size ratio in small varices group were 13.25cm, 11.4mm and 1420.16 respectively while in large varices group they were 15.9cm,14.5mm and 687.5 respectively with respective p value of 0.001,0.0001 and 0,001. **Conclusion:** Low platelet count, low WBC count, increasing Bilirubin levels, increasing portal vein diameter, increasing spleen size, and lower values of platelet count/spleen diameter ratio were significantly associated with large varices.

KEYWORDS

Oesophageal varices, Portal hypertension, Cirrhosis

INTRODUCTION

Portal hypertension -hallmark of liver cirrhosis is defined by portal pressure gradient of more than 5-10 mm Hg . The development of oesophageal varices and gastrointestinal bleeding is a serious complication in people with portal hypertension. When individuals with liver cirrhosis are diagnosed, oesophageal varices are seen in around 40% of those with compensated disease and 60% of those with decompensated illness[1,2]. Nearly 12% of people with minor oesophageal varices progress to larger one, according to estimates[3]. In non-selected patients with cirrhosis of the liver who have never bled before, the annual incidence of first variceal bleeding is estimated to be roughly 5%[4,5]. It has been demonstrated that the size of oesophageal varices is connected to the risk of variceal bleeding[6], with large oesophageal varices being at a higher risk; this may be owing to a higher variceal wall tension in large oesophageal varices[7]. Thus, annual incidence of gastrointestinal bleeding is only 1-2 percent in patients without varices, 5% in patients with minor oesophageal varices, and 15% in patients with big oesophageal varices[8]. Long term usage of beta-adrenergic receptor antagonists has been shown to reduce the risk of initial variceal bleeding in people with extensive oesophageal varices[9]. However, because this medication has side effects, it should only be utilized in patients who have significant oesophageal varices[10].

While endoscopy is currently the gold standard for diagnosing oesophageal varices, non-invasive methods for predicting the presence or absence of significant varices are needed to reduce the number of endoscopic operations required. Platelet count, splenomegaly, advanced Child status, serum albumin, and high portal vein diameter at ultrasonography have all been reported to be good non-invasive markers of large oesophageal varices in patients with cirrhosis in several investigations. A study was conducted to evaluate the utility of various clinical, biochemical, and ultrasonographic parameters for predicting the presence of large oesophageal varices in Indian patients with liver cirrhosis. This is important as Indian patients typically present late, have a poorer nutritional state, and have a high number of patients with viral aetiology.

AIMS AND OBJECTIVES:

- To study the incidence of esophageal varices in patients with liver disease.
- To evaluate various Non-invasive (clinical, biochemical and ultrasonographic) parameters in predicting the presence of large esophageal varices.

METHODOLOGY:

This was prospective observational study conducted over 18 months from February 2020 to August 2021 on 50 known cases of liver disease with portal hypertension attending the tertiary care hospital.

Inclusion Criteria:

- Age:18 years to 80 years
- Liver disease with portal hypertension.

Exclusion Crieteria:

- Primary hematologic disorders
- Active gastrointestinal bleeding on admission
- Taking drugs for primary prophylaxis of variceal bleeding
- History of EST or band ligation, TIPS

All relevant data including history, examination, laboratory parameter was noted. Laboratory parameters include: CBC, detailed LFT, PT-INR, ascitic fluid study, USG PS Doppler and endoscopy. From data various non-invasive (clinical, biochemical and USG) parameters were analysed on how much they predict incidence of oesophageal varices.

Statistical Analysis:
Proper statistical analysis was applied with help of Biostatistician using Mann Whiteny U test , paired /unpaired t test or chi square test. P value ≤ 0.05 will be significant.

RESULTS:

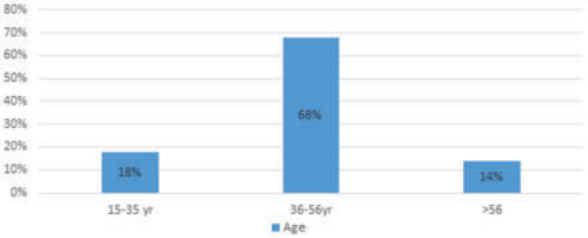

Figure 1: Age Group**1.**Our study has max number of patients in 36-56yr age group with median age being 48.

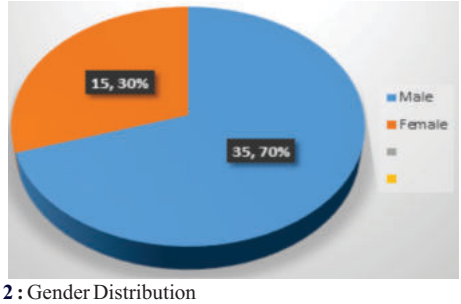

Figure 2 : Gender Distribution

2. Out of 50 patients 35(70%) were male and 15(30%) were female.

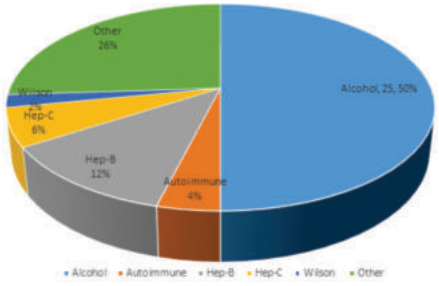

Figure 3. Distribution of study subjects as per Aetiology

3. In our study , most common aetiology of liver disease was alcohol 25(50%) followed by HBV 6(12%), HCV 3(6%), autoimmune2(4%), Wilson 1(2%) and rest 13(26%)were cryptogenic.

Table 1. Distribution of study subjects as per Lab Parameters (n=50)

Laboratory Parameters	Median	Range
Hemoglobin(gm/dl)	8.05	3-12.5
WBC (cells/mm3)	5060.00	1080-15600
Platelet(cells/mm3)	132000.00	25000-442000
Bilirubin(mg/dl)	1.70	0.3-25.7
SGOT(IU/L)	55.00	17-234
SGPT (IU/L)	38.00	9-220
Serum Albumin(g/dl)	2.5	1.4-4.2
INR	1.79	1.06-8.2

4) When studied lab parameters considering the median of all it was found that HB was 8.05(3-12.5) mg/dl, WBC count was 5060(1080-15600) cells/mm3, Platelet count was 25000-4420000 cells/mm3, bilirubin was 1.70(0.3-25.7) mg/dl, SGOT was 55(17-234)IU/l, SGPT was 38(9-220) IU/l, serum albumin was 2.5(1.4-4.2) g/dl and INR was 1.79(1.06-8.2)

Table 2. Distribution of study subjects as per Child Pugh Score, Grade of Ascites and grade of Encephalopathy

	Grade	Numbers	Percentage (%)
Child Pugh score	A	8	16
	B	20	40
	C	22	44
Ascites	No Ascites	11	22
	Mild	6	12
	Moderate	14	28
	Severe	19	38
Encephalopathy	None	37	74
	1	3	6
	2	4	8
	3	3	6
	4	3	6
	Total	50	100

5) When classified according to Child pugh score 16% were in Child A, 40% were in Child B and 44% were in Child C .

6) In our study , 22% had no ascites,12% had mild ascites,28% had moderate and 38% had severe ascites

7) In our study it was found that 26% have encephalopathy out of which 6% were in grade 1,8% were in grade 2,6% were in grade 3 and 6% were in grade 4.

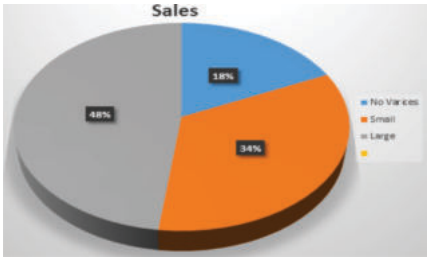

Figure 4. Distribution of study subjects as per endoscopy Findings

8) In the our study out of 50 participants 24(48%) patients had large oesophageal varices,17(34%) had small and 9(18%) had no varices

Table 3: **Correlation of WBC count ,PLATELET COUNT AND S.BILIRUBIN with Grades of Varices (n=50)**

	Grades of Varices				P value
	Small or No Varices		Large Varices		
	N=26		N=24		
	Median	Range	Median	Range	
WBC (cells/mm3)	7050	2000-15600	4550	1080-12000	0.025
Platelet (cells/mm3)	194000	46000-442000	111000	25000-269000	0.002
Bilirubin (mg/dl)	0.85	0.3-9.7	2.55	0.4-25.7	0.003

*Mann Whitney U test

In this study Median WBC count in small/No varices group was 7050 cells/mm3 while in large varices group it was 4550 cells/mm3 with p value 0.025. Median platelet count in small/No varices group was 194000 cells/mm3 and in large varices group it was 111000cells/mm3 with a p value 0.002. Median bilirubin level in small/No varices group was 0.85mg/dl while in large varices group it was 2.55mg/dl with a p value 0.003.Thus low wbc count, low platelet count and increased bilirubin level were significantly associated with large varices.

Table 4: Correlation of Spleen Size, Portal vein Diameter, Platelets-Spleen ratio and Grades of Varices (n=50)

	Grades of Varices				
	Small or No Varices		Large Varices		* P value
	N=26		N=24		
	Median	Range	Median	Range	
Spleen Size (cm)	13.25	8.3-18	15.9	10.2-25.8	0.001
Portal Vein Size (mm)	11.4	8-15.2	14.5	7.5-22.4	0.0001
Platelets-spleen diameter ratio	1420.16	328.94-4804.34	687.5	144,32-2241.67	0.001

*Mann Whitney U test

As per our results, Median spleen size in small/No varices group was 13.25cm while in large varices group it was 15.9cm with a p value 0.001 .

Median portal vein diameter in small varices group was 11.4mm while in large varices group it was 14.5mm with a p value 0.0001. Median

platelet spleen diameter ratio in small varices group was 1420.16 while in large varices group it was 687.5 with a p value 0.001.Thus large spleen size ,large portal vein diameter and low platelet spleen diameter ratio was significantly associated with large varices.

DISCUSSION

Due to the increasing prevalence of chronic liver diseases, variceal haemorrhage is associated with significant morbidity, mortality, and health care costs. Numerous studies have demonstrated the efficacy of beta-blockers for primary prevention of variceal bleeding in patients with high-risk varices indicating the importance of screening for the presence of oesophageal varices. Therefore, there is a particular need for a non-invasive predictor for the presence of oesophageal varices to ease the medical, social and economic burden of the disease. Many previous studies have documented good predictive value of various non-endoscopic variables for the presence or absence of varices, but available data in India is limited. Therefore, this study was conducted to evaluate various Non-invasive (clinical, biochemical and ultrasonographic) parameters in predicting the presence of large oesophageal varices. In the present study out of 50 participants, 24(48%) of the study subjects had large oesophageal varices,17(34%) had small and 9(18%) had no varices. Majority (68%) of the participants were belong to 35-56 years, median age was 48(18-72) years. Out of total participants 70% were males and 30% were females. Similarly study done by (Sarangapani et al., 2010)[11] found that 48% had large varices,24% had small varices and 26% had no varices, median age of the participants was 45(18- 74)years,72 were male patients 34 were female patients,. Similar study done by (Madhotra et al., 2002)[12] found that 13% had large varices ,35% had small varices and 51 % had no varices, median age was 46 year ,64% were male and 36% were female. In the present study most common aetiology of liver disease was alcohol (50%) followed by HBV(12%), HCV(6%), autoimmune(4%). Similar to these findings (Sarangapani et al., 2010)[11]found that aetiology of liver disease in the study was alcohol (49%), followed by HBV (19.8%), Autoimmune hepatitis (4.7%), HCV (1.8%). (Madhotra et al., 2002)[12] also found that most common aetiology was alcohol followed by HBV and HCV.. When studied ascites, it was found that 22% had no ascites,12% had mild ascites, 28% had moderate and 38% had severe ascites. Study done by (Sarangapani et al., 2010)[11] found that 26% had no ascites,30% had mild, 26% had moderate and 16% had severe ascites. When studied lab parameters, in Complete blood counts considering the median of all, it was found that hemoglobin was 8.05(3-12.5) mg/dl, WBC count was 5060(1080-15600) cells/mm3 and Platelet count was 25000-442000 cells/mm3. In this study Median WBC count in small varices group was 7050 cell/mm3 while in large varices group it was 4550 cells/mm3 with p value 0.025. Thus, Low WBC count was significantly associated with large varices. .Study done by sarangapani et al [11] found low WBC as significant predictor of large esophageal varices Median platelet count in small varices group was 194000 while in large varices group it was 111000. With a p value 0.002, low platelet count was significantly associated with large varices. Study done by (Sarangapani et al., 2010)[11] found that Median platelet count in large varices group was 90,100 while in small varices group it was 2 lakh and it was signigificant

Alassan Kouame Mahassadi et al[13] found that Median platelet count in large varices group was 90000 and median platelet count in small varices group was 1.46 lakh. With a p value <0.001,low platelet count was significantly associated with large varices. When studied liver function test, Median bilirubin in small varices group was 0.85mg/dl and median bilirubin in large varices group was 2.55.with p value 0.003 it was significantly associated with large varices. In Study done by sarangapani et al[11] Median bilirubin in small varices group was 2.2mg/dl and median bilirubin in large varices group was 3.1 (p value - 0.04) and was significant.In our study, Median spleen size in small varices group was 13.25cm and Median spleen size in large varices group was 15.9cm with a p value 0.001 .

Median portal vein diameter in small varices group was 11.4mm and Median portal vein diameter in large varices group was 14.5mm with a p value 0.0001. Similar to these findings Sarangapani et al [11] in there study reported that increasing portal vein diameter, (p value- 0.001) and increasing spleen size, (p value- 0.001) was found to be significantly associated with large varices. Study done by Alassan Kouame Mahassadi et al[13] reported that spleen size was the significant predictor of large esophageal varices. In Sharma SK et al [14]study splenomegaly was found to be independent predictor of large oesophageal varices. While studying Platelet count/spleen diameter ratio, median value in small varices group was 1420.16 while in large varices group was 687.5 with p value 0.001 low ratio was significantly associated with varices.In Edoardo G.Giannini et al[15] study it was found low platelet /spleen diameter ratio was found to be significantly associated with large varices.

Similarly in Sarangapani et al[11] low platelet/spleen diameter ratio was found to be significant.

CONCLUSION:

This study concluded that non-invasive procedures play great importance while diagnosing oesophageal varices. Low platelet count, Low WBC count, increasing bilirubin levels, increasing portal vein diameter, increasing spleen size, lower values of platelet count/spleen diameter ratio were significantly associated with large varices. In this study platelet count, splenomegaly, portal vein size, platelet/spleen size ratio were the good predictor of large oesophageal varices . Thus these non-invasive procedures should be used in diagnosing the patients of oesophageal varices to start primary prophylaxis as early as possible and to improve the cost of health care.

Conflict Of Interest

The Authors have no conflicts of interest that are directly relevant to the content of this clinic-pathological case

Financial Resources

There are no financial resources to fund this study.

Informed Consent

Informed Consent was obtained from the patient.

Author's Contribution

All the authors contributed equally to the case report.

Data And Materials Availability

All data associated with this study done at tertiary care centre hospital are present in the paper

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