

Child Pugh Score as a Predictor of Large Oesophageal Varices in Chronic Liver Disease Patients

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ABSTRACT

Introduction: Variceal hemorrhage is a major complication of chronic liver disease. If patients at low or high risk of having esophageal varices (EV) could be identified by the Child Pugh score in predicting the size of oesophageal varices in patients with chronic liver disease. The main objective of this study was to determine whether Child Pugh Score can be used as a predictor of large oesophageal varices in chronic liver disease patient.

Methods: A prospective cross-sectional study was conducted in emergency and medicine ward of Tribhuvan University Teaching Hospital from August 2015 to December 2015 with diagnosed chronic liver disease without history of previous medication for varices and any surgical intervention were studied. Patients underwent physical examination, hematological and biochemical tests and abdominal sonography and upper gastrointestinal endoscopy. Presence and absence of esophageal varices size was noted and correlation with Child Pugh Score and its associated variables studied.

Results: Alcoholic liver disease was the major cause for chronic liver disease with most common age group involved being 41-50 years and 72% prevalence of esophageal varices. A statistically significant association was found between oesophageal varices grade and Child-Pugh's classification grades i.e., the higher grade of oesophageal varices is associated with advanced grade of Child's classification.

Conclusions: Child Pugh Score had a predictive value to diagnose esophageal varices in chronic liver disease patients. The predictive accuracy as compared to the gold standard test "UGI endoscopy" showed that these parameters cannot replace endoscopy as the diagnostic test but can be used as a screening tool especially in a country like Nepal where availability of endoscopy facilities and access to tertiary care hospitals is an issue.

Keywords: chronic liver disease; esophageal varices; non- endoscopic predictors.

INTRODUCTION

Chronic liver disease is a disease process of the liver that involves a process of progressive destruction and regeneration of the liver parenchyma leading to fibrosis and cirrhosis.¹ and finally forms esophageal, gastric, rectal varices.²

Upper GI endoscopy remains the gold standard for screening³ with significant cost and burden to the patients and endoscopy units. Therefore, considerable interest in developing models to predict the presence of high-risk varices by non-endoscopic methods from easily obtainable clinical variables. It would be very much helpful in a country like Nepal where availability and affordability of endoscopy is an issue.

Thus, this study was conducted to determine whether Child Pugh score which can be

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derived from simple hematological and biochemical parameters can be used to predict the grades of varices.

METHODS

A prospective cross-sectional study was conducted in emergency and medicine ward of Tribhuvan University Teaching Hospital from August 2015 to December 2015 in period of 6 months. The study was approved by ethical committee of Institutional Review Board, Institute of Medicine, Tribhuvan University. The inclusion criteria were all patients aged 17 years or above diagnosed to have chronic liver disease (irrespective of their etiology). History of endoscopic variceal sclerotherapy or band ligation or Transjugular Intrahepatic Portosystemic Shunt (TIPS), history of surgery for portal hypertension, medication use for primary prophylaxis of variceal bleeding were excluded from study.

All patients admitted to the emergency and internal medicine ward with diagnosis of chronic liver disease within my study period and fulfilling the inclusion criteria. Altogether 75 patients fulfilled my inclusion criteria.

Subject were explained in detailed about the study and written informed consent was taken. Relevant history and physical characteristics including symptoms and signs of liver failure (spider angioma, palmar erythema etc.), hepatomegaly, splenomegaly, and abdominal vein collaterals were recorded. Ascites was graded as none, mild, moderate or severe. Hepatic encephalopathy was graded from grade 0 to IV, as per the West Haven Criteria. Diagnosis of chronic liver disease was based on clinical, biochemical, and ultrasonographic findings. Hematological and biochemical workup included measurement of hemoglobin, total leukocyte count, platelet count, Liver function tests, Ultrasonography findings, prothrombin time, and serum concentrations of bilirubin (total

and conjugated) & albumin. For each patient, a modified Child-Pugh score was calculated. Later the findings of endoscopy was taken from medicine ward and was correlated with Child Pugh Score. The degree of esophageal varices was classified according to Paquet Grading system of varices and further classified into small and large varices based on AASLD and Baveno IV recommendations.

Statistical analysis was performed using SPSS v 20. Data were analyzed in the form of cross tabulation mean and hypothesis testing. Each continuous parameter between two groups of patients with and without varices and those with small and large varices were analyzed with two tailed chi square test. Data were compared using cut off value from previous studies. P value of less than 0.05 was considered significant. Correlation coefficient was calculated of various tests and compared. Ninety-five percent confidence intervals were used in all analyses.

It was calculated from clinical and laboratory parameters as described below.

Table 1. Child Pugh Scoring System

Parameter	1 point	2 points	3points
Bilirubin(mg/dl)	<2	2-3	>3
Albumin(gm/dl)	>3.5	2.8-3.5	<2.8
Prothrombin time increase(sec)	1-3	4-6	>6
Ascites	None	Slight	Moderate
Encephalopathy	None	1-2	3-4

Esophageal varices

Endoscopic presence of varices were noted and graded as per Paquet grading system of grade 1-4 as discussed below and then subcategorized into small and large varices. Paquet grade 1 & 2 were categorized into small varices and 3 & 4 as large varices.

Paquet endoscopic grading of esophageal varices

Grade 1: small and flattened by insufflation of air

Grade 2: moderate sized varices slightly larger and do not flatten

Grade 3: large varices larger but do not touch each other in the middle of the lumen

Grade 4: very large varices large and touch each other in the middle of the lumen

RESULTS

The mean age of cirrhotic patients included in the study was 48 years ± 9.66 years (mean ± SD). Chronic liver disease was seen maximum in age group 41- 50 years among the study population with highest burden of esophageal varices in same group. P value was not significant.

Table 2. Age group wise distribution of the study population of chronic liver disease patients and endoscopic finding

Age group	N=75	No varices (n=21)	Varices (n=54)	P value
21-30	6	4	2 (50%)	NS
31-40	16	6	10(62%)	
41-50	27	4	23(85%)	
51-60	19	5	14(74%)	
61-70	7	2	5(71%)	

According to Child Pugh’s classification, 8 cirrhotics (10%) belonged to Class A, 22 cirrhotics (34%) belonged to class B and 45 cirrhotics (56%) belonged to class C.

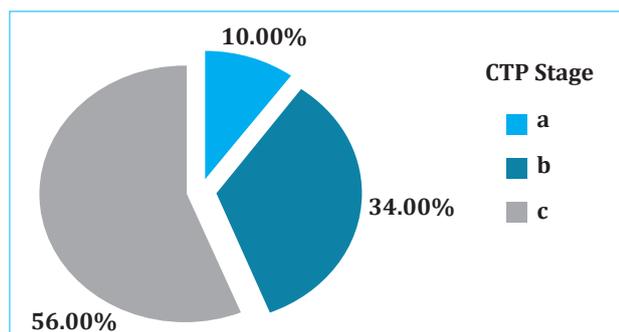


Figure 1. Pie chart showing Child Pugh’s class distribution of chronic liver disease.

Alcoholic liver disease was the most common cause of chronic liver disease. It comprised of 65 patients (86%) and has the highest burden of varices. Chronic viral hepatitis B accounted for 8 cases (10%) and Hepatitis C for 1 case . 1 case had Non alcoholic steatohepatitis(NASH) as its cause for chronic liver disease.

Table 3. Etiology of chronic liver disease and endoscopic finding.

Etiology	N=75	No varices (n=21)	Varices (n=54)	P
Alcohol	65(86%)	16 (23%)	49 (77%)	NS
Hepatitis B	8 (10%)	4 (50%)	4 (50%)	
Hepatitis C	1	0	1	
NASH	1	1	0	

Among the 54 cirrhotic patients who had endoscopic evidence of esophageal varices, 18 patients (33.3 %) had small varices while 36 patients (66.6%) had large varices. Among Child Pugh score, class C had highest percentage of large varices (58%) while class A had no large varices.

Table 4. Comparison of the presence and absence of varices according to Child Pugh(CP) Score

CP score Endoscopic Grading	Number N=75		CP-A (n=8)	CP-B (n=22)	CP-C (n=45)
No varix	21		5(63%)	7(32%)	9(20%)
Grade I	8	Small varices (n=18)	2(25%)	2(9%)	4(9%)
Grade II	10		1(12%)	3(14%)	6(13%)
Grade III	17	Large varices (n=36)	0	6(27%)	11(24%)
Grade IV	19		0	4(18%)	15(34%)

A statistically significant positive correlation (p-value <0.05) was found between oesophageal varices grade and Child-Pugh’s classification grades i.e., the higher grade of oesophageal varices is associated with

advanced grade of Child's classification

Table 5. Relations between Child Pugh score and Esophageal Varices

Variables	N=54	CP-A	CP-B	CP-C	Chi-Square test	P-value
Small varices	n=18	3	5	10	8.0623	0.0177
Large varices	n=36	0	10	26		

DISCUSSION

In this study, average age of the patients was 48 ± 9.66 with maximum patients belonging to the age group 41-50 years with 38 patients (76%) in the study group being males. It was almost the same as compared to the study in Dharan by Pradhan⁴ et al showing 49.06 ± 11 as the mean age for chronic liver disease with 72% being males. In this study, alcoholic liver disease was the most common etiology accounting for 86% of all causes of chronic liver disease. It was in accordance with the study carried out in Dharan by Maskey, et al⁵. who also found alcohol to be the most common cause of chronic liver disease (60%).

In the study group, 10% patients were of Child Turcotte Pugh class A, 34% class B and 56 % class C. This study differs from the findings of Ehab Nashat⁶ et al where there were child-Pugh's class A (38%), 21 were class B (42%) and 10 were class C (20%). The reason for this huge difference in number of patient between Child A and Child C must be due to the fact that patients admitted in wards of tertiary care hospital comprised of cases with complications of chronic liver disease of liver.

The prevalence of esophageal varices as diagnosed by UGI endoscopy was 68% in this study population. It was in accordance to the study done by Arulprakash S, et al⁷ in India which too showed their prevalence rate of 72.4%. However a larger prospective and a landmark study by Giannini, et al.⁸ reported 54 % prevalence of esophageal varices, and

among these 21.6 % had large esophageal varices. Mean age of patients was 54 years in study done by Giannini et al compared to 48 years mean in our study. This study reported a prevalence of large varices as 48% which differs from the study by Giannini, et al and the possible reasons could be the smaller sample size of my study, different population race and possible bias due to study population based on patients admitted in tertiary care setup.

As regard the correlation between Child -Pugh's classification grades and OV grades, there was a statistically significant positive correlation between the grade of OV and the grade of child's classification which was in agreement with the work of Cales et al., 1990⁹ who postulated that enlargement of OV had been reported to be more common in patients with high initial Child-Pugh score. It was also in agreement with the work of Ehab H. Nashaat⁶ who postulated that OV grade had a positive significant correlation ($P < 0.05$) with Child Pugh's classification grade.

So this study showed that using Child Pugh Score that involved routine clinical examination, hematological & biochemical parameters and values devised from their measurements had a predictive value to diagnose esophageal varices in cirrhotic patients. The predictive accuracy as compared to the gold standard test "UGI endoscopy" showed that these parameters cannot replace endoscopy as the diagnostic test but can be used as a screening tool especially in a country like Nepal where availability of endoscopy facilities and access to tertiary care hospitals is an issue.

CONCLUSIONS

Child Pugh Score had a predictive value to diagnose esophageal varices in chronic liver disease patients. The predictive accuracy as compared to the gold standard test "UGI

endoscopy” showed that these parameters cannot replace endoscopy as the diagnostic test but can be used as a screening tool especially in a country like Nepal where availability of endoscopy facilities and access to tertiary care hospitals is an issue.

CONFLICT OF INTEREST: None

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