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TO DETERMINE THE NON-ENDOSCOPIC PREDICTORS FOR IDENTIFICATION OF ESOPHAGEAL VARICES ON PATIENTS OF CIRRHOSIS: AN ANALYTICAL STUDY

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Abstract:

Objective: *To describe the biochemical, hematological and ultrasonographic determinants of esophageal varices in cirrhosis patients.*

Study design: *A cross-sectional, analytical study.*

Location and Duration: *In the Gastroenterology Department of Benazir Bhutto Hospital, Rawalpindi for one year duration from May 2018 to April 2019.*

Methods: *150 subjects with cirrhosis and no varices hemorrhage history underwent hematological, physical, abdominal ultrasound and biochemical examinations. All patients underwent esophagogastroduodenoscopy (EGD). The presence of varices in EGD correlated with regression analysis and biochemical, ultrasonographic and hematological variables.*

Results: *Esophageal varices was observed in 96 patients and no varices was present in 54 patients. In 22 patients, High grade varices were noted and low grade varices in 74 patients. The platelet count < 88x103, Serum albumin was < 2.95 g / dl and diameter of portal vein > 11 mm was associated with the presence of varices. Serum albumin <2.95g / dL and varices are estimated to have a high degree of portal vein diameter greater than 11 mm.*

Conclusion: *Patients with a platelet count <88 x 103 / l, serum albumin <2.95 g / dl, and diameter of portal vein > 11 mm are most probably have high-grade varices.*

Key words: *Portal vein diameter, Serum album, Cirrhosis.*

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INTRODUCTION:

Cirrhosis is determined by hepatocellular lesion causing nodular regeneration and liver fibrosis. In the United States, the tenth leading cause of death is Cirrhosis and is often irreversible disease. Clinical features are the result of portosystemic shunt, portal hypertension and hepatic cell dysfunction. The most common causes are chronic hepatitis B, chronic alcohol abuse and autoimmune diseases, chronic hepatitis C infection, Wilson's disease, metabolic disorders, hemochromatosis, etc. drugs, for example. methotrexate, amadiarone, methyldopa, etc. and other causes such as Bud Chairi syndrome, Hepatic vein thrombosis etc. The cirrhosis patients prevalence of varies was between 20 and 30%. After the development of varices, 1/3rd of all patients die from bleeding from gastroesophageal varices. The initial bleeding risk from varices is 26 to 36% at 2 years and one year after the varices the episode of first bleeding occur have been detected. In Western studies, mortality, the first episode bleeding episode ranged from 18% to 58% compared to 6% to 10% noted in our population. Recently, on portal hypertension, Baveno III consensus conference suggested that all patients with cirrhosis should be screened for the esophageal varices presence during the diagnosis of liver cirrhosis. In patients with varices, endoscopy is recommended between 1 and 2 years to evaluate the development or progression of varices in patients with cirrhosis. However, this procedure has 2 main limitations. Endoscopy is an expensive and invasive procedure, since only 10-37% of cirrhosis patients vary in endoscopic detection. Routine evaluation of patients with high risk of varices may be less costly to reduce the cost of the endoscopy unit procedure and to decrease the increased burden. There are determinants that verify the first variceal bleeding risk. Some clinical, biochemical and ultrasound parameters have a good diagnosis power to assess the risk of varices, either alone or in combination, in a non-invasive manner. However, the factors predicting the presence of varices are not well defined. Determination of non-invasive predictive factors of esophageal varices allows us to perform GI endoscopy in patients of selected group, thus limiting not necessary interventions.

MATERIALS AND METHODS:

This cross-sectional analytical study was performed in the Gastroenterology Department of Benazir Bhutto Hospital, Rawalpindi for one year duration from May 2018 to April 2019 for one year duration from June 2017 to June 2018. 150 patients with cirrhosis and no variceal bleeding history underwent hematological, physical, abdominal ultrasound and biochemical examination. All patients underwent (EGD) esophagogastroduodenoscopy. All subjects done with upper GI endoscopy to determine the presence and esophageal varices degree with the 160 Olympus video endoscopy and the varices presence in EGD was associated with regression analysis with biochemical, ultrasonographic and hematological variables. Patients with liver cirrhosis without a history of lower or upper gastrointestinal bleeding were selected. The cirrhosis confirmation is rely on existing physical findings, ie spider navi, palmar erythema, gynecomastia, ascites or splenomegaly, abnormal liver function tests, modified coagulation profile, and low serum albumin and serum albumin tests. The transverse caudate lobe ratio to the transverse right lobe width was> 0.64. All patients selected for the analysis were evaluated with hematological, clinical, ultrasound and biochemical parameters and according to Child-Pugh criteria were classified. Patients were included in the study with transjugular intrahepatic porto-systemic shunt, esophagus varices or patients with sclerosis or band ligation for transparent hypertension surgery. Patients receiving variceal bleeding medication for primary prophylaxis and active alcohol abuse patients (six months less than alcohol withdrawal) were not included. The esophagus varices are divided into small and large varices that are minimally projected or minimally projected by insufflation in the esophagus lumen, flattened by insufflation in the esophageal lumen, or minimally projected in the esophageal lumen, protruding at least in the esophageal lumen and protruding from contact between them (presence of association) or minimum 51% of the esophageal lumen. The classification is used (I-IV). Class I and II were small, class III and IV were classified as large for this study. The SPSS 17.0 was used for Statistical analysis. Results were expressed as mean ± standard deviation. Varices analysis is used to estimate the degree of varices.

RESULTS:

150 were the total patients. The ratio between male and female was 1.14: 1 (75/75). The patients mean age was 54 (± 12.11) years. Clinical examination revealed palpable spleen in 26 patients and a palpable liver in 14 patients under the right costal border. According to physical examination, hematological and biochemical parameters were found to be 22 in class A, 73 in class B, 55 in Pugh class, 55 in group C, moderate in 75 patients, mild in 6 patients and acid in 30 patients. EGD was performed in all patients and esophageal variation was observed in 97 patients. 22 patients had high-grade varices, and low-grade varices in 75. With high-grade varices 9 patients were managed with band ligation because of the occurrence of hemorrhagic

symptoms and gastric varices were in 24 patients, 23 gastric-esophageal varices and 6 isolated gastric varices. The different variables mean values were compared between patients with and without variables as shown in Table I.

Table I: Comparison of variables in patients with and without varices

	Patients with varices Mean±SD (Total patients: 97)	Patients without varices Mean ± SD (Total patients: 53)	p-value
Platelet count (× 10^3/µL	99 ± (73.08)	109±(69.24)	0.046
Prothrombin time (sec)	18.50 ±(6.02)	21.49 ± (19.20)	0.319
Serum potassium (mEq/dl	3.99 ± (0.82)	4.40 ± (0.83)	0.027
Serum albumin (g/dl)	2.74 ± (0.08)	3.26 ± (0.62)	0.007
Cholesterol (mg/dl)	103.86± (148.65)	160.6 ± (27.98)	0.340
Child score	8.49 ± (1.87)	8.65 ± (1.95)	0.706
Portal vein diameter (mm)	12.95 ± (2.07)	10.37 ± (2.68)	0.023
Size of spleen (mm)	14.50 ± (2.28)	14.73 ± (2.55)	0.669
Age (years)	51.52 ±(10.83)	54.23 ± (11.57)	0.245
SD-Standard deviation			

Linear correlation showed a strong relationship between the presence of gynecomastia and varices (p-0.027), serum albumin (p-0.007), platelet count (p-0.02, serum potassium (p-0.028) and the portal vein diameter (p-0.023). The esophageal varices degree included a significant relationship with gynecomastia (p-0.048), serum potassium (p-0.140), platelet count (p-0.170), serum albumin (p-0.012) and portal vein diameter (p-0.012). For serum platelets, cut-off values of 88 x 103 / µl, for portal vein11 mm diameter and for serum albumin2.95 g / dl were determined by ROC curve. The specificity, sensitivity, negative predictive value, positive predictive value, OR (association rate) and area under the ROC curve (recipient operating characteristics) were approved to confirm as shown in Table II.

Table II: Values of variables in predicting presence of varices

Variables	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	OR	Area under ROC
Serum albumin < 2.95gms/dl	62	66.8	76	51	3.34	0.66
Platelet count < 88 10^3 / µL	58.5	62.7	72.4	47.7	0.42	0.338
Portal vein diameter > 11mm	91	25.6	67.54	64.23	3.74	0.582
PPV-Positive predictive value; NPV-Negative predictive value; OR-Odds ratio: ROC-Receiver operating characteristic						

To determine the predictability of varices grade using variance analysis (ANOVA), serum potassium, <88 x 103 / esL platelet count, portal vein diameter and serum albumin were confirmed. The portal vein diameter> 11 mm (p-0.043) and Serum albumin <2.95g / dl (p-0.028) had predictive values significantly for high-grade variables. These variables were confirmed by stepwise logistic regression analysis to estimate esophageal varices. In multivariate analysis, the portal vein diameter (p value 0.039) and Serum albumin (p value 0.014) had a strong predictive value compared to a non-strong association with platelet count (0.156). Any of the 3 predictive factors presence can verify the presence of varices with 11% specificity and 100% sensitivity, the presence of3 variables with a specificity of 89% and sensitivity of 23%. The varices presence in Table III shows the predictability of different combinations of these variables.

Table III: Combined predictability of three significant predictors for esophageal varices

Predictors present	%age of original grouped cases correctly classified
Albumin < 2.95g/dl	64
Portal vein diameter > 11mm	67
Platelet count < 88,000/μ L	60.2
Albumin < 2.95g/dl and PV diameter > 11mm	62.8
Albumin < 2.95 g/dl and platelet count < 88,000/ μ L	65.5
PV diameter > 11mm and platelet count < 88,000/ μL	61.4
Albumin <2.95 g/dl, Platelet count <88,000/ μL and PV diameter >11mm	63.7

DISCUSSION:

In the esophagus varices the non-invasive diagnosis, most of the studies were performed in a specific group of patients to be included in the waiting list for liver transplantation. The uniformity was not observed in the classification of esophageal varices or in a sufficient statistical analysis. The factors that were previously defined as esophageal varices, the noninvasive predictors were less reproducible in clinical practice, were subject to inter-observer variability and were evaluated differently even in the similar analysis. In this analysis, only simple, reproducible and frequently encountered parameters are discussed. Much research have been conducted to evaluate the laboratory, clinical and imaging factors strongly linked with the varices presence. In the physical examination of 346 patients, the presence of splenomegaly and the large varices presence with thrombocyte count below than 88 x 103 / μL were found to be independent risk factors. The hepatic dysfunction degree probably affects the development of portal hypertension with hormonal factors and hence the development of varices. Portal vein diameters greater than 11 mm were significantly correlated with high-grade variables with sensitivity and specificity of 91% and 25.7%, respectively. In ultrasound examination, the width of the portal vein is an indirect indicator of the portal pressure responsible for the development of varices. Low platelet counts are involved in many recent studies on esophageal varices. It is believed that the destruction of splenic sequestration and platelet-derived antibodies is the cause of thrombocytopenia in patients with cirrhosis32. It was found that there was an independent predictor of the presence of a platelet count lower than 88 x 103 / μL. Varices However, a low area below the ROC and a low probability index (OR) show a weak relationship. Poor correlation of platelet counts was probably due to factors independent of portal hypertension, which may lead to thrombocytopenia, such as suppression of bone marrow in cirrhosis patients. The combined predictability model of these three variables showed that patients with none of these three variables were not variable. However, when making an observation of EGD, only 60-65% accuracy is obtained in patients with only two or three predictors.

CONCLUSION:

Platelets count are associated with the presence of varices less than 88 x 103, serum albumin less than 2.95 g / dl, and ultrasound in the portal vein independent of the variance of more than 11 mm in diameter. Patients with complete cirrhosis and no history of upper GI bleeding should be subjected to surveillance endoscopy if any of these predictors are identified.

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