Non-endoscopic Examination as Predictor of Varices Degree in Liver Cirrhosis Patients Who have Experienced Esophageal Variceal Bleeding

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ABSTRACT

Background: *Standard diagnosis for determining the degree of varices is by endoscopy. However, sometimes there are obstacles in the implementation of endoscopy. Based on the factors, we need to know the parameters of non-endoscopic examination which include ascites, splenomegaly, thrombocytopenia, Child-Pugh, portal vein diameter as a predictor of the degree of liver cirrhosis patients with varices who have experienced esophageal variceal bleeding.*

Method: *The study design was cross-sectional study. The study was conducted on hospitalized patients in Cipto Mangunkusumo hospital, Gatot Subroto hospital, and Kraton hospital from September 2008 to November 2009. The patients were liver cirrhosis patients with history of upper gastrointestinal bleeding, no present bleeding, and hemodynamically stable. Examination of predictor factors in the patients such as ascites, splenomegaly, thrombocytopenia, Child-Pugh and portal vein diameter were done. Statistical analysis was performed with student's t-test, Mann-Whitney test, and stepwise multivariable logistic regression.*

Results: *The study involved 44 patients with liver cirrhosis who have esophageal variceal bleeding. Based on the results of endoscopic examination, large varices (F3) were found in 21 (47.73%) patients, small varices (F1 & F2) in 23 (52.27%) patients, located on the distal esophagus extending to the medial (86.4%), with red color sign present (54.5%). Results of non-endoscopic examination such as splenomegaly, ascites, thrombocytopenia, portal vein diameter and Child-Pugh score was known not to be associated with the degree of esophageal varices ($p > 0.05$).*

Conclusion: *Non-endoscopic examination was not related to the degree of varices in liver cirrhosis patients who have experienced esophageal variceal bleeding.*

Keywords: *esophageal variceal bleeding, liver cirrhosis, predictor factors, endoscopic criteria*

ABSTRAK

Latar belakang*: Diagnosis baku untuk menentukan derajat varises adalah dengan endoskopi, namun terkadang ada kendala dalam pelaksanaan endoskopi. Berdasarkan hal tersebut perlu diketahui parameter pemeriksaan non-endoskopi antara lain asites, splenomegali, trombositopeni, Child-Pugh, diameter vena portal sebagai prediktor derajat varises pasien sirosis hati yang telah mengalami perdarahan varises esofagus.*

Metode*: Desain penelitian ini adalah studi potong lintang. Penelitian dilakukan pada pasien rawat inap di rumah sakit Cipto Mangunkusumo, rumah sakit Gatot Subroto, dan rumah sakit Kraton periode September 2008–November 2009. Pasien sirosis hati dengan perdarahan saluran cerna bagian atas, sudah tidak berdarah, hemodinamik stabil. Terhadap pasien dilakukan pemeriksaan faktor-faktor prediktor seperti asites, splenomegali, trombositopeni, Child-Pugh dan diameter vena portal. Analisis statistik dilakukan dengan student t test, Chi-square, dan stepwise multivariabel logistic regression.*

***Hasil**: Didapatkan 44 pasien sirosis hati yang telah mengalami perdarahan varises esofagus ikut dalam penelitian ini. Berdasarkan hasil endoskopi didapatkan varises besar (F3) sebanyak 21 (47,73%) pasien, varises kecil (F1 & F2) 23 (52,27%) pasien, letak di distal memanjang sampai medial esofagus (86,4%), red color sign (54,5%). Pemeriksaan non-endoskopi antara lain splenomegali, asites, trombositopenia, diameter vena portal, skor Child-Pugh tidak berhubungan dengan derajat varises esofagus (p > 0,05).*

***Kesimpulan**: Pemeriksaan non-endoskopi tidak berhubungan dengan derajat varises pasien sirosis hati yang telah mengalami perdarahan varises esofagus.*

***Kata kunci**: perdarahan varises esofagus, sirosis hati, faktor prediktor, kriteria endoskopi*

INTRODUCTION

Portal hypertension is a common complication in patients with liver cirrhosis, and as a complication of portal hypertension is the emergence of esophageal varices. The prevalence of esophageal varices in patients with liver cirrhosis ranges between 60-80%, while the prevalence of esophageal variceal bleeding in patients with liver cirrhosis between 30-40% and mortality due to variceal bleeding between 17-57%.[1,2] The incident of esophageal variceal rebleeding ranges from 30-40% in one year, and the mortality rate will increase to more than 50%. Large esophageal variceal bleed more frequently than small esophageal varices.[1]

Portal hypertension consensus from several researchers regarding the non-endoscopic examination as predictor of varices was carried out. Their study showed that non-endoscopic examination could be used as predictor of esophageal varices. The result can be used to prevent bleeding.[2-8] Another study assessed predictors of esophageal varices after bleeding, but results are still controversial among one and other studies.[1,9,10] The study was actually simple, the parameters are usually there and easily found in clinical practice, but it is less developed in clinical practice. This is due to a difference between research subjects or the means used.

Some barriers often occur when performing endoscopy, which are the examination is invasive and endoscopic tools exist only in certain hospitals, specific knowledge/skill is required by an endoscopy expert to operate or interpret the results, patient factors such as delay with no apparent reason, fear of pain, unwillingness to be treated after the action, the costs of action, duration of waiting, or prolonged disease diagnosis.[11,12,13,14]

In this study non-endoscopic examination was done to predict the degree of varices in patients with liver cirrhosis who have esophageal variceal bleeding. Examinations performed include physical examination, laboratory work, abdominal ultrasound and endoscopy. Variables that were analyzed are large spleen (splenomegaly), platelet count (thrombocytopenia), Child-Pugh, ascites, and portal vein diameter. The purpose of this study was to determine the parameters of non-endoscopic examination as the predictor of the degree of varices in liver cirrhosis patients who have experienced esophageal variceal bleeding.

METHOD

The study design was cross-sectional study. The study was conducted on patients who were treated in Cipto Mangunkusumo hospital, Gatot Subroto hospital, and Kraton hospital from September 2008 - November 2009. The samples were taken from patients hospitalized with a diagnosis of liver cirrhosis who experienced upper gastrointestinal (UGI) bleeding.

The criteria for admission include: (1) patients with liver cirrhosis with UGI bleeding; (2) not bleeding at the moment with stable hemodynamic; (3) willing to participate in the study. The criteria for rejection include: (1) contraindications for endoscopy present; (2) existing malignant disease, portal vein thrombosis, history of splenectomy/shortcut porto systemic surgery; (3) patients with esophageal variceal bleeding that has been performed ablation of varices per endoscopy (ligation/ sclerotherapy esophageal varices) at the previous bleeding.

Data were collected in tailor-made forms, transported and processed with personal computer with SPSS version 16. The results were set forth in the average yield, standard deviation, and median with interquartile range for all continuous variables and proportion or percentages for data categories. Bivariate analysis was performed using Student's t-test for continuous variables and Mann Whitney U test for categorical variables. It was said to be statistically significant, if $p < 0.05$. Furthermore, for variable with $p < 0.25$, multivariate analysis was performed using a stepwise multivariable logistic regression.

RESULTS

Forty-four liver cirrhosis patients who have esophageal variceal bleeding participated in this study. Most patients (81.8%) consisted of male. The average age of patients was 52.5 years old and has suffered from cirrhosis of the liver for two years.

Multivariate analysis of the degree of varices was performed on variables with $p < 0.25$ on univariate

Table 1. Characteristic of patients with upper gastrointestinal bleeding

Characteristic	Mean (n = 44)
Anamnesis	
Male/female (%)	81.8/18.2
Age (years)	52.50 (21–66)
Duration of liver cirrhosis (years)	2.00 (1–9)
Hematemesis melena (times)	2.00 (1–10)
Physical examination	
Systolic BP (mmHg)	100.0 (90–120)
Diastolic BP (mmHg)	70.0 (60–80)
Pulse (times/second)	76 (58–120)
Clinical ascites (%)	59.10
Clinical splenomegaly (%)	75.00
Degree of encephalopathy (%)	
Grade 1	45.5
Grade 2	52.3
Grade 3	2.3
Laboratory examination	
Hemoglobin (g/dL)	9.4 (± 1.6)
Thrombocyte (/uL)	92,454 (± 37,524)
Coagulation status (seconds)	3.5 (0.3–8.5)
Albumin (g/dL)	2.8 (± 0.5)
Bilirubin (mg/dL)	1.7 (0.6–8.5)
AST (U/L)	44.0 (10.0–303.0)
ALT (U/L)	43.0 (17.0–383.0)
Liver cirrhosis (%)	
HBsAg positive	72.7
Anti HCV positive	18.2
Non-B non-C	9.1
Child-Pugh (%)	
A	6.8
B	36.4
C	56.8
Ultrasonography	
Diameter of portal vein (mm)	12.5 (± 2.7)
Spleen (mm)	140.0 (± 17.8)
Ascites (%)	79.5
Degree of EV (%)	
F1	11.4
F2	40.9
F3	47.7
Location of EV (%)	
Distal	100.0
Medial	86.4
Proximal	38.6
Red color sign (%)	54.5
Color of VE (%)	
Blue	61.4
White	38.6

BP: blood pressure; AST: aspartate transaminase; ALT: alanine transaminase HBsAg: hepatitis B surface antigen; HCV: hepatitis C virus; EV: esophageal varices

Table 2. The relationship between non-endoscopic examination and the degree, color, location of varices and red color sign

Characteristic	Degree of varices			Color of varices			Red color sign			Location of varices		
	Small (F1/F2) n=23	Large (F3) n=21	p	Blue n = 27	White n = 17	p	Positive	Negative	p	II	MI/SI	p
Age (years)	55 (35–66)	52 (21–66)	0.217*	52 (21-66)	56 (41-64)	0.223*	52 (21-66)	55.5 (35-66)	0.262*	50 (43–59)	53.5 (21–66)	0.559*
Sex (%)												
Male	55.6	62.5	0.448	61.1	38.9	1.000	55.6	44.4	1.000	13.9	86.1	1.000
Female	37.5	44.4		62.5	37.5		50.0	50.0		12.5	87.5	
Duration of liver cirrhosis (years)	1 (1–8)	3 (1–9)	0.219	2 (1-9)	2 (1-8)	0.970*	2 (1–9)	2 (1–7)	0.874*	1.5 (1–5)	2.5 (1–9)	0.356
Hematemesis melena (times)	2 (1–4)	2 (1–10)	0.094	2 (1-10)	2 (1-4)	0.620*	2 (1–10)	2 (1–4)	0.941*	2 (1–3)	2 (1-10)	0.960
Hemodynamic												
Systolic BP (mmHg)	110 (100–120)	100 (90–120)	0.014*	110 (90-120)	110 (100-120)	0.075*	110 (90–120)	110 (100–120)	0.261*	120 (110–120)	110 (90–120)	0.012*
Diastolic BP (mmHg)	70 (60–80)	70 (60–80)	0.101*	70 (60-80)	70 (60-80)	0.198*	70 (60–80)	70 (70–80)	0.015*	75 (70–80)	70 (60–80)	0.070*
Pulse (times/seconds)	80 (58–100)	70 (64–120)	0.087*	74 (58-120)	80 (64-100)	0.05*	76 (68–120)	80 (58–100)	0.952*	80 (70–80)	75 (58–120)	0.536*
Clinical ascites (%)												
Positive	42.3	57.7	0.199	69.2	30.8	0.330	61.5	38.5	0.417	11.5	88.5	0.676
Negative	66.7	33.3		50.0	50.0		44.4	55.6		16.7	83.3	
Clinical splenomegaly (%)												
Positive	48.5	51.5	0.601	60.6	39.4	0.330	54.5	45.5	1.000	18.2	81.8	0.311
Negative	63.6	36.4		63.6	36.4		54.5	45.5		0.0	100.0	
Degree of encephalopathy (%)												
1	65.0	35.0	0.145	45.0	55.0	0.037	60.0	40.0	0.474	10.0	90.0	0.720
2	39.1	60.9		78.3	21.7		52.2	47.8		17.4	82.6	
3	100.0	0.0		0.0	100.0		0.0	100.0		0.0	100.0	
Hemoglobin (g/dL)	9.9 ± 1.6	8.7 ± 1.4	0.011†	89 ± 1.7	10.0 ± 1.3	0.037	8.8 ± 1.6	10.10 ± 1.33	0.005	10.46 ± 1.12	9.19 ± 1.63	0.075
Thrombocyte (/uL)	96,600 ± 33,506	87,900 ± 41,843	0.449†	94,300 ± 41,201	89,600 ± 31,804	0.693	93,000 ± 42,819	91,800 ± 31,036.3	0.911	75,500 ± 14,515.5	95,100 ± 39,420.9	0.238
Albumin (g/L)	2.8 ± 0.6	2.6 ± 0.5	0.349†	2.7 ± 0.5	2.8 ± 0.7	0.595	2.7 ± 0.5	2.8 ± 0.6	0.913	2.7 ± 0.5	2.8 ± 0.6	0.942
Bilirubin (mg/dL)	1.7 (0.2–8.5)	1.5 (8–6.6)	0.455	1.8 (0.6-7.7)	1.6 (0.8-8.5)	0.875*	1.6 (0.8-6.6)	1.7 (0.6-8.5)	0.795*	1.6 (1.3–8.5)	1.7 (0.6-7.7)	0.472*
Coagulation status (second)	3.5 (0.5–7.2)	3.6 (0.3–8.5)	0.866	3.9 ± 2.6	3.4 ± 1.8	0.421	3.8 ± 2.6	3.7 ± 2.1	0.906	3.5 ± 2.5	3.8 ± 2.3	0.729
Transaminase (U/L)												
AST	85.34 ± 72.35	64.95 ± 55.3	0.303	61 (10-303)	50.0	0.257*	46.5 (10–209)	44 (17–303)	0.580*	44 (35–132)	46.5 (10–303)	0.855*
ALT	51 (21–283)	38 (17–383)	0.335	82.7 ± 98.7	12.5	0.129	64.1 ± 54.0	75.8 ± 92.6	0.605	50.6 ± 24.6	72.3 ± 78.1	0.508
Liver cirrhosis												
HBsAg positive (%)	59.4	40.6	0.230	50.0	50.0	0.015	53.1	46.9	1.000	12.5	84.4	1.000
Anti HCV positive (%)	37.5	62.5	0.484	87.5	12.5	0.125	62.5	37.5	0.710	13.9	91.7	
Child-Pugh (%)												
A	66.7	33.3	0.174	33.3	66.7	0.069	66.7	33.3	0.541	0.0	100.0	1.000
B	68.8	31.2		43.8	56.2		43.8	56.2		18.8	81.2	
C	40.0	60.0		76.0	24.0		60.0	40.0		12.0	88.0	
Diameter of portal vein (mm)	11.9 ± 2.6	13.2 ± 2.6	0.137†	12.7 ± 2.9	12.3 ± 2.2	0.564	13.0 ± 2.8	12.0 ± 2.4	0.214	12.2 ± 3.3	12.6 ± 2.6	0.709
Spleen (mm)	38.2 ± 18.6	142.0 ± 16.8	0.485†	141.2 ± 19.9	138.1 ± 14.1	0.582	140.7 ± 18.7	139.1 ± 16.9	0.777	147.0 ± 11.7	138.9 ± 18.3	0.304

Characteristic	Degree of varices			Color of varices			Red color sign			Location of varices		
	Small (F1/F2) n=23	Large (F3) n=21	p	Blue n = 27	White n = 17	p	Positive	Negative	p	II	MI/SI	p
Ascites-USG (%)												
Positive	45.7	54.3	0.137	65.7	34.3	0.275	57.1	42.9	0.710	14.3	85.7	1.000
Negative	77.8	22.2		44.4	55.6		44.4	55.6		11.1	88.9	
Location of EV												
Distal	83.3	16.7	0.021									
Medial	31.8	68.2										
Proximal	68.8	31.2										
Red color sign (%)												
Positive	29.2	70.8	0.002									
Negative	80.0	20.0										
Color of EV												
Blue	25.9	74.1	0.000									
White	94.1	5.9										

BP: blood pressure; AST: aspartate transaminase; ALT: alanine transaminase; HBsAg: hepatitis B surface antigen; HCV: hepatitis C virus; USG: ultrasonography; EV: esophageal varices, II: inferior location; MI: medial location; SI: superior location *Mann-Whitney Test; † Unpaired student's t-test; # Chi square test

Table 3. Characteristic of non-endoscopic examination in esophageal varices with high risk of bleeding

Characteristic	High risk n = 17	Non high risk n = 27	p
Age (years)	50 (21-66)	56 (35-66)	0.080*
Sex (%)			
Male	36.1	63.9	0.690
Female	50.0	50.0	
Duration of liver cirrhosis (years)	3 (1–9)	2 (1–8)	0.644*
Hematemesis melena (times)	2 (1–10)	2 (1–4)	0.129*
Hemodynamic			
Systolic BP (mmHg)	110 (90–120)	110 (100–120)	0.109*
Diastolic BP (mmHg)	70 (60–80)	70 (60–80)	0.140*
Pulse (times/seconds)	70 (68–120)	80 (58–100)	0.176*
Clinical ascites (%)			
Positive	50.0	50.0	0.063
Negative	22.2	77.8	
Clinical splenomegaly (%)			
Positive	39.4	60.6	1.00
Negative	36.4	63.6	
Degree of encephalophaty (%)			
1	35.0	65.0	0.616
2	43.5	56.5	
3	0.0	100.0	
Hemoglobin (g/dL)	8.5 ± 1.4	9.9 ± 1.5	0.002
Thrombocyte (/uL)	98,400 ± 45,112	88,700 ± 32,239	0.414
Albumin (g/L)	2.6 ± 0.4	2.8 ± 0.6	0.386
Bilirubin (mg/dL)	1.9 (0.8–6.5)	1.7 (0.6–8.5)	0.791*
Coagulation status (seconds)	3.8 ± 2.5	3.6 ± 2.3	0.737
Transaminase (U/L)			
AST	79.8 ± 63.8	73.0 ± 66.6	0.737
ALT	43 (20–205)	42 (17–383)	0.664*
Liver cirrhosis			
HBsAg positive (%)	34.4	65.6	0.489
Anti HCV positive (%)	50.0	50.0	0.690
Child-Pugh (%)			
A	33.3	66.7	0.330
B	25.0	75.0	
C	48.0	52.0	
Diameter of portal vein (mm)	13.1 ± 3.1	12.2 ± 2.3	0.238
Spleen (mm)	142.1 ± 19.5	138.7 ± 16.7	0.539
Ascites-USG (%)			
Positive	42.9	57.1	0.453
Negative	22.2	77.8	

BP: blood pressure; AST: aspartate transaminase; ALT: alanine transaminase; HBsAg: hepatitis B surface antigen; HCV: hepatitis C virus; USG: ultrasonography, *Mann Whitney test

analysis, namely Child-Pugh score, ascites either clinical or by ultrasonography, and the diameter of the portal vein (Table 4).

Table 4. Multivariate logistic regression analysis of predictive factors of non-endoscopic examination on the degree of esophageal varices

Parameter	Adjusted OR	95 % CI	p
Child-Pugh	0.474	0.105–2.152	0.334
Acsites	0.640	0.098–4.177	0.641
Clinical	0.982	0.130–7.431	0.986
Ultrasonography	0.241	0.044–1.326	0.102
Diameter of portal vein	1.116	0.844–1.476	0.442

DISCUSSION

Endoscopic examination of patients with UGI bleeding aims to determine the source of bleeding. However, in patients with liver cirrhosis, it is necessary to evaluate the size and measurement, the location of varices, the varices color and former bleeding signs such as red color sign (RCS). Japanese Research for Portal Hypertension endoscopic criteria described it in detail.[15]

Esophageal varices that often bleeds is large varices (LV), especially those located in border areas of gastroesofagus. Because in that area the intramural pressure of esophagus is negative, the transmural pressure difference becomes high.[16] The high transmural pressure and fluctuating portal flow cause the enlargement of varices and the thinning

of the walls so they bleed easily. On endoscopic examination, the muscularis mucosa of the proximal esophagogastric junction of portal hypertension patient was replaced by submucosal varices associated with epithelial surfaces through subepithelial or intraepithelial vessels that RCS would be found in the endoscopic examination.[17] The risk of bleeding increases when the varices elongated and wind up to the proksimal.[18] In addition, blue varices and RCS (cherry red spots, red whale marking, hematocytic) appears.[19,20] In these conditions, the sizes of esophageal varices are unstable.[19]

The risk factors for esophageal variceal bleeding are an important thing to know in order to prevent rebleeding (secondary prophylaxis). The worsening of liver function and the continuing of liver cirrhosis condition would lead to the emergence of esophageal varises.[18,21] Bad nutrition, low albumin level, high billirubin level, high alkaline phosphates, low oxygen saturation, and encephalopathy are predictor factors of increased bleeding.[9]

In this study, more small varices (52.3%) were found than large varices (47.7%). It was in accordance with Ismail et al, but different from studies conducted Limquiaco et al that acquired more large varices than small varices. The different results of endoscopic examination are mainly caused by the operator, the examination techniques, the interpretation of results, or the criteria used.[1,9]

This study showed an enlarged spleen, both clinically and by ultrasound, even though the results were not statistically significant in relation to the degree of varices. In 75% of patients, splenomegaly was found clinically and by ultrasound, with spleen size 140.0 ± 17.75. Patients with large varices experienced more splenomegaly (51.5%) and longer spleen (142.0 ± 16.8). Ismail et al, Goh et al, and Limquiaco et al, found splenomegaly in cases with esophageal variceal bleeding with varying percentage results. Several factors can influence the outcome of these assessment, which include the technique of examination, the experience of the examiner, the patient's position (left lateral or supine), and the presence of asites.[1,9,10]

In this study platelet counts were found decreased compared to normal value. Patients with large varices had a lower platelet values (87,900 ± 41,843/uL) than patients with small varices (96,600 ± 33,506/uL). However, statistically the difference of values to the degree of varices platelets was not significant ($p = 0.449$). This result is no different from the study done by Ismail et al, Goh et al, and Limquiaco et al.[1,9,10] Thrombocytopenia is clinically found in many large varices, but the cut-off value obtained is different. Several factors can affect the production of platelets, such as alcohol consumption, folate deficiency, advanced liver disease, or failure of production.[9]

There were 59.1% patients with ascites based on clinical examination and 79.5% by ultrasound. Ascites were more common in patients with large varices, either through clinical examination (57.7% vs. 42.3%) or ultrasonography (54.3% vs. 45.7%). Ascites were statistically insignificant in relation to the degree of esophageal varices. Similar result was found in the study of Ismail et al, based on the results of clinical examination on patients with large varices many asites were found, while based on radiological examination the results did not differ between patient with large and small varices. Regarding this, Goh et al and Limquiaco et al found ascites with varying percentages in the study of esophageal variceal bleeding.[9,10] The results were heavily influenced by the technique of examination, the experience of the examiner, the position of the patient, the amount of ascites and also the previous use of diuretics.[10]

Based on the ultrasound, the average diameter of the patients' portal vein was 12.5 ± 2.65 mm. In the present study, widening of the diameter of the portal vein was found. In large varices greater diameter of portal vein were found (13.17 ± 2.57 mm), compared to small varices (11.97 ± 2.64 mm). In statistical analysis, the widening of the diameter of the portal vein is not significantly related to the degree of varices. These results differ from studies of Ismail et al that obtain portal vein diameter value that did not differ between large veins and small varices.[1] Several factors can affect the results of the portal vein diameter measurement such as the techniques of examination, the experience of the examiner, and the position of the patient.[9]

Functionally patient with UGI bleeding due to the outbreak of esophageal varices is on Child-Pugh C degree. Most patients in this study were patients with Child-Pugh C (56.8%) and most patients with Child-Pugh C are patients with severe esophageal varices (60%). It shows that large varices have worse liver function ability than small varices. Statistically relationship between Child-Pugh classification and the degree of esophageal varices showed no significant results. Meanwhile, other researchers have obtained somewhat different results. Ismail et al found that the patients were in Child-Pugh C if they suffer from large varices.[1] Goh et al found that the value of Child-Pugh was not a predictive factor for esophageal varices.[10] Finally, Limquiaco et al who examined patients with esophageal variceal bleeding found that most liver functions were in the Child-Pugh B degree.[9] Child-Pugh score is influenced by many factors, such as, the operator, the measuring tool used, the technique in assessing the existence of ascites, the prior treatment

given, the standard value used, and the number of parameters supporting the value.[21]

Limitations of this study include the small sample size resulting in a small study power or too large size effect and the time used. The research was conducted at 5-6 days after esophageal variceal bleeding, in which the patient's condition at the moment was still unstable. Hematological manifestations will undergo a change in a state of advanced liver disease and also the difference of hepatic venous pressure gradient (HVPG) will fluctuate in bleeding condition. In addition, many factors also influence the results, which include the operator, the measuring instruments, the examination techniques, the prior treatment given, the default value used, and the number of parameters supporting variable.[9,10,16,21] However, the result obtained in this study, clinically there was a difference between large and small varices.

CONCLUSION

Non-endoscopic examination (splenomegaly, thrombocytopenia, the degree of Child-Pugh, the presence of ascites, and large diameter of the portal vein) is not associated with the degree of esophageal varices in patients with liver cirrhosis that have bled.

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