ORIGINAL ARTICLE

Correlation between the Severity of Liver Cirrhosis with Esophageal Varices in RSUD Dr Soetomo Surabaya

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ABSTRACT

Introduction: Liver cirrhosis is the end stage of chronic liver disease. The morbidity and mortality associated with complications of liver cirrhosis are very high. In cases of death caused by cirrhosis of the liver, it tends to increase from around 676,000 in 1980 to more than one million in 2010, globally equivalent to 2% of all mortality in the world (Mokdad et al., 2014). The mortality rate increases if there are complications such as ascites, hepatic encephalopathy, esophageal varices, and liver cancer, with success rates of 20-60%, 50%, 70-90% (D'Amico, 2014). In liver cirrhosis with esophageal varices, it is reported that patients with mild and severe liver cirrhosis risk 40% and 85% for varicose veins. So, this research is to determine the correlation between the severity of liver cirrhosis with esophageal varices in Dr. Soetomo General Hospital Surabaya.

Methods: This study was an analytic observational with a cross-sectional study design. The research subjects used in this study were patients diagnosed with liver cirrhosis with esophageal varices from January 2015 - December 2016. Data were collected from medical records and analyzed using the spearman correlation test. Sampling was carried out in total sampling.

Results: Of 26 subjects, most of the subjects were men (69.32%), the highest severity of liver cirrhosis from the Child B group (53.85%), and the highest esophageal varices were grade II and III (46,15%). The most results from each group based on the severity of liver cirrhosis were Child A with grade II esophageal varices (66.7%), and Child B with grade II esophageal varices (64.3%), and Child C with esophageal varices grade III esophagus (88.9%). A correlation coefficient was obtained at 0.659 ($p < 0.005$).

Conclusion: This research concludes a significant correlation between the severity of liver cirrhosis and esophageal varices.

Keywords: Liver Cirrhosis, Esophageal Varices

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INTRODUCTION

Liver cirrhosis is the end stage of chronic liver disease. The etiology of liver cirrhosis varies geographically. In western countries, the most common causes are chronic hepatitis C virus infection, excessive alcohol consumption, and non-alcoholic fatty liver disease (NAFLD). In contrast, chronic hepatitis B infection is the leading cause in the Asia-Pacific region (Zhou at al., 2014). The morbidity and mortality associated with complications of liver cirrhosis are very high. In cases of death caused by cirrhosis of the liver, it tends to increase from around 676,000 in 1980 to more than one million in 2010, globally equivalent to 2% of all mortality in the world (Mokdad et al., 2014). In Europe, it is estimated that deaths caused by liver cirrhosis reach 170,000 annually (Blachier et al., 2013). In the United States, chronic liver disease and cirrhosis cause around 35,000 deaths each year. Liver cirrhosis ranks 9th in the United States and causes around 1.2% of all deaths in the United States (Wolf, 2017). The mortality rate increases with complications such as ascites, hepatic encephalopathy, esophageal varices, and liver cancer, with success rates of 20-60%, 50%, 70-90% (D'Amico, 2014).

This research is to determine the correlation between the severity of liver cirrhosis with esophageal varices in Dr. Soetomo General Hospital Surabaya. In liver cirrhosis with esophageal varices, it is reported that patients with mild and severe liver cirrhosis risk 40% and 85% for varicose veins. Esophageal varices develop in patients with liver cirrhosis of about 5-8% per year, but large varicose veins can pose a risk of bleeding in only 1-2% of cases. About 4-30% of patients with small varicose veins will develop large varicose veins every year and therefore can be at risk for bleeding (World Gastroenterology Organisation, 2014).

METHODS

This study was an observational analytic study with a cross-sectional design. This study was conducted in the medical record section of Dr Soetomo Hospital from January 2015 to December 2016. The sample of this study was part of the population that was in accordance with the inclusion criteria and not in accordance with the exclusion criteria. Inclusion criteria: All medical records of patients aged 30-80 diagnosed with liver cirrhosis based on history, physical examination, laboratory, and endoscopy. Exclusion criteria: Exclusion was carried out in patients with incomplete data, liver malignancies, parasitic infections, and diabetes mellitus. Sampling is done using total sampling. Descriptive statistics analyzed data. The

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Spearman parametric test will calculate the correlation between the severity of liver cirrhosis and esophageal varices. This study is significant if the value is $p < 0.05$.

RESULTS

Data collection is done by taking data from the medical record section of the Inpatient Installation of Dr. Soetomo Hospital. Medical records of patients with cirrhosis of the liver with esophageal varices in the Inpatient Installation of Dr Soetomo Hospital in January 2015 - December 2016 were 26 medical records.

Table 1. Characteristics of the patients

Characteristics	Frequency	Percentage
Gender		
Male	18	69.23%
female	8	30.77%
Age (years)		
≤ 40	2	7.69%
41 – 50	6	23.07%
51 – 60	14	53.85%
61 – 70	3	11.54%
≥ 71	1	3.85%

Of the 26 patients with liver cirrhosis with esophageal varices, 18 (69.23%) were male, and 8 (30.77%) were female. In this study, the highest age group of patients was 51 - 60 years, with 53.85%.

Tabel 2. Distribution of liver cirrhosis based on classification of Child Pugh

	Frequency	Percentage
Child A	3	11.54%
Child B	14	53.85%
Child C	9	34.61%
Total	26	100%
	Frequency	**Percentage**
Child A	3	11.54%
Child B	14	53.85%
Child C	9	34.61%
Total	26	100%

In this study, the highest results were obtained in the Child B group, 53.85%, followed by Child C, 34.61%, and Child A, 11.54%.

Table 3 Distribution of Esophageal Varices in Patients with Liver Cirrhosis

	Frequency	Percentage
Grade I	2	7.69%
Grade II	12	46.15%
Grade III	12	46.15%
Total	26	100%

The highest distribution of esophageal varices in patients with liver cirrhosis was grade II and III, 46.15%, and the least were grade I at 7.69%.

Table 4 Distribution of Liver Cirrhosis Patients with Esophageal Varices

Classification of Liver Cirrhosis	Grade Varices Esofagus							
	Grade I		Grade II		Grade III		Total	
	f	%	f	%	f	%	f	%
Child A	1	33.3	2	66.7	0	0	3	100
Child B	1	7.1	9	64.3	4	28.6	14	100
Child C	0	0	1	11.1	8	88.9	9	100
Total	2	77.7	12	46.2	12	46.2	26	100

In this study, results were obtained from the Child A group with grade II esophageal varices (66.7%), Child B group with grade II esophageal varices (64.3%), and Child C group with grade III esophageal varices 8 (88.9%).

DISCUSSION

Characteristics of Research Subjects

Gender is estimated to have a role in the occurrence of cirrhosis of the liver; because of differences in social and lifestyle environment between men and women, generally, men have a greater chance of contact with hepatitis B virus or hepatitis C and alcohol consumption behavior (Lovena et al., 2017). In this study of 26 patients with cirrhosis of the liver with esophageal varices, 18 were male (69.23%), and eight were female (30.77%). In this study, the highest frequency of cirrhosis of the liver with esophageal varices is male. The highest number of sexes was found in men, around 74.5% (Tungadi, 2017). Elfatma's study also found that patients with liver cirrhosis were mainly male, around 75.8% (Elfatma et al., 2017).

In this study, patients with cirrhosis of the liver with esophageal varices were in the age range of 40-75 years, and the largest group at the age of 51-60 years. Cirrhosis of the liver is a silent disease, so it is often found with age and

pathological changes that develop slowly until the onset of symptoms (Tungadi, 2017). Based on Tungadi, in 2017, it was found that the highest age group of patients with liver cirrhosis was age 51-60 years (38.3%) (Tungadi, 2017). The results of this study are not much different from the research of Yestria Elfatma, who obtained the highest age group, 51-60 years (37.9%) (Elfatma et al., 2017). Patients with liver cirrhosis are more common in the age group 51-60 years because alcohol consumption and etiological factors such as contact with the hepatitis B virus or hepatitis C occur for a long time.

Distribution of liver cirrhosis based on classification of Child-Pugh

Cirrhosis of the liver is a silent disease that takes years to develop symptoms that indicate the occurrence of cirrhosis of the liver. The results were Child A 11.54%, Child B 53.85%, and Child C 34.61%. Based on the results of this study, it was found that the largest group was Child B, at 53.85%. Asmi's research found that the results were not much different, the most of which was the Child B group of 45.6% (Azmi, 2017). In contrast to the effects of Al Hijjah's research, the highest results were obtained from the Child C group, which amounted to 44.9%, followed by Child B at 41% and Child A at 14.1% (Al Hijjah et al., 2017). The study results from Yestria Elfatma showed different results, namely the highest number of patients from the Child C group at 47%, followed by Child B at 43.9% and Child A at 9.1% (Elfatma et al., 2017). The results of Lovena's research got the most results from the Child C group at 60.3%, followed by Child B at 34.5% and Child A at 5.2% (Lovena et al., 2017). This shows that patients who come for treatment are mostly with moderate-to-severe cirrhosis because of the early stages of asymptomatic hepatic cirrhosis, so they are often found accidentally when patients carry out routine health checks or for other causes (Lovena et al., 2017).

Distribution of Esophageal Varices in Patients with Liver Cirrhosis

In the study, results obtained were grade I as many as two people (7.69%), grade II as many as nine people (46.15%), and grade III as many as six people (46.15%). Based on the results of this study, it was found that most groups were grade II and III, which were the same, namely 46.15%. In contrast to the results of research from Yestria Elfatma, it was shown that the highest group was grade III esophageal varices at 71.2%, followed by grade II at 15.2% and at least grade I esophageal varices at 13.6% (Elfatma et al., 2017). This study is not much different from the results of research from Miro getting the same amount between esophageal varices of grade II and grade III, which was 33.8% (Miro, 2007).

The portal vein carries blood from the stomach, intestine, spleen, gallbladder, and pancreas to the liver. Cirrhosis causes the structure of the liver to turn into scar tissue so that these changes block blood flow, leading to the heart not running smoothly. This causes an increase in pressure in the portal vein. This condition is called portal hypertension. Portal hypertension is the most common complication of cirrhosis of the liver. This condition can cause other complications, such as varicose veins in the esophagus, stomach, or both. Esophageal varices are one of the most frequent complications of liver cirrhosis. New esophageal varices give symptoms when varicose veins have ruptured; the emergence of hematemesis or melena characterizes this. The higher the esophageal varices grade, the higher the chance for bleeding. If not treated immediately, bleeding due to varicose veins can be fatal (Liou et al., 2018).

Distribution of Liver Cirrhosis Patients with Esophageal Varices

Esophagogastroduodenoscopy (EGD) screening for esophageal varices is highly recommended when a diagnosis of cirrhosis has been established. EGD testing is recommended based on the severity of liver cirrhosis and the size of esophageal varices. Patients with complex cirrhosis who do not have esophageal varices complications are advised to do EGD every 2-3 years. Patients with complex cirrhosis with small esophageal varicose size are recommended to do EGD every 1-2 years, whereas patients with decompensated cirrhosis are advised to do EGD every year (World Gastroenterology Organization, 2014).

Many successful studies have shown an association between the severity of liver cirrhosis and esophageal varices. One of them is the result of research from Thapa et al. with a total sample of 50 people getting the most results from each group, namely from Child A group with VE grade I by 60%, followed by Child B group with VE grade II by 20% and group Child C with VE grade III of 10% (Thapa et al., 2017). The study results from Elfatma et al. with the number of subjects, as many as 66 people getting the most results from each group were Child AB with VE grade III of 31.8%, followed by Child C with VE grade III of 39.4% (Elfatma et al., 2017).

In this study with 26 subjects, the most results from each group were Child A group with VE grade II as many as two people (66.7%), Child B group with VE grade II as many as nine people (64.3%), and Child C group with VE grade III as many as eight people (88.9%). Based on the analysis test results with Spearman correlation, the results obtained $p < 0.05$, meaning there is a significant relationship between the severity of liver cirrhosis and esophageal varices.

CONCLUSION

This study concluded that with a total sample of 26, most were male sex (69.32%); the highest age group of patients were aged 51-60 years (53.85%). The Child B group obtained the highest liver cirrhosis severity (53.85%). Esophageal varices grade was obtained with the same number between grade II and III (46.15%). There was a significant correlation between the severity of liver cirrhosis and esophageal varices. The higher the severity of liver cirrhosis, the higher the grade of esophageal varices.

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CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

ETHICS CONSIDERATION

This research was ethically cleared and approved by Ethical Committee for Health Research of Dr Soetomo General Academic Hospital.

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AUTHOR CONTRIBUTION

All authors have contributed to all process in this research, including preparation, data gathering and analysis, drafting

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REFERENCES

Al Hijjah F, Yaswi R, Afrainin Syah N. 2017. Gambaran Jumlah Trombosit Penyakit pada Pasien Sirosis Hati di RSUP Dr. M. Djamil Padang. Available at http://file:///C:/Users/USER/Desktop/746-1399-1-SM.pdf.

Azmi I. 2017. Hubungan Berat Ringannya Sirosis Hepatis Dengan Derajat Varises ESOFAGUS. Available at http://scholar.unand.ac.id/25044/1/1.%20ABSTRAK-Izzatul%20Azmi.pdf.

Blachier M, Radosavljevic M, Valla D, Thoraval F. 2013. The burden of liver disease in Europe: a review of available epidemiological data. J Hapetol 58: 593-608. doi: 10.1016/j.jhep.2012.12.005.

D'Amico G. 2014. Natural history and stages of cirrhosis. Variceal Hemorrhage, 15-28. doi:10.1007/978-1-4939-0002-2_2.

Elfatma Y, Arnelis A, Rachmawati N. 2017. Gambaran Derajat Varises Esofagus Berdasarkan Beratnya Sirosis Hepatis. Jurnal Kesehatan Andalas 6: 457-462. doi: https://doi.org/10.25077/jka.v6i2.721.

Liou I, Price J, Kim H. Screening for Varices and Prevention of Bleeding. Available at https://www.hepatitisc.uw.edu/go/management-cirrhosis-related-complications/varices-screening-prevention-bleeding/core-concept/all.

Lovena A, Miro S, Efrida E. 2017. Karakteristik pasien sirosis hepatis di RSUP Dr. M. Djamil Padang. Jurnal Kesehatan Andalas 6: 5-12. doi: https://doi.org/10.25077/jka.v6i1.636.

Miro S. 2007. Hubungan antara parameter non-invasif dengan derajat varises esofagus pada sirosis hati. Padang, Bagian Ilmu Penyakit Dalam FK Universitas Andalas.

Mokdad A, Lopez A, Shahraz S, et al. 2014. Liver cirrhosis mortality in 187 countries between 1980 and 2010: a systematic analysis. BMC Med 12: 145. doi: 10.1186/s12916-014-0145-y.

Thapa P, Maharjan D, Tamang T, et al. 2017. Clinical correlation between Child Pugh's score and oesophageal varices in upper gastrointestinal endoscopy in cirrhotic patient. Journal of Kathmandu Medical College 4:135-139. https://doi.org/10.3126/jkmc.v4i4.18255.

Tungadi N. 2017. Hubungan Nilai Prothrombin Time dan Albumin dengan Staging pasien Sirosis Hepatis di RSUP DR Wahidin Sudirohusodo Makassar Januari-Desember 2016. Skripsi. Makassar, Universitas Hasanuddin.

Wolf D. Cirrhosis: Practice Essentials, Overview, Etiology. Available at https://emedicine.medscape.com/article/185856-overview.

World Gastroenterology Organization. 2014. World Gastroenterology Organization Global Guidelines: Esophangeal Varices. Available at https://www.worldgastroenterology.org/guidelines/esophageal-varices/esophageal-varices-english.