HEPATIC CIRRHOSIS
ASSOCIATION OF PLATELET COUNT, SPLENOMEGALY AND ESOPHAGEAL VARICES IN PATIENTS

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ABSTRACT... Objective: To see the association of platelet count, splenomegaly and development of oesophageal varices. **Study Design:** Observational study. **Duration of study:** One year from January 2010 to December 2010. **Setting:** Gastroenterology Department, Medical Unit III, Nishtar Hospital Multan. **Methodology:** One hundred ten cirrhotic patients were included. The record of these patients was scrutinized and data collected was entered and analyzed through SPSS 11. The patients were divided into three groups according to platelet count. Group I with platelet count less than 50000/mm^3, group II with platelet count of 50000 to 100000/mm^3 and group III with platelet count of 100000 to 150000/mm^3. Similarly patients were also divided into three groups according to splenic size. Group I with splenic size 11 – 13 cm, group II with splenic size 13–16 cm and group III splenic size more than 16 cm. In each group presence of esophageal varices along with grading was noted. **Results:** The age of the patients varied from 15 to 80 years and mean age was 48.55 ± 13.88 years. Sixty five (59.1 %) were male and 45 (40.9%) were female. The hemoglobin level of these patients varied from 6.0 to 14.3 gm/100 ml with mean level of 9.23 ± 2.11gm/100ml. The platelet count varied from 22000 to 385000/mm^3. The splenic size varied from 9 to 18 cm with mean of 12.53 ± 2.14 cm. Esophageal varices were detected in 102 cases. Seventeen cases were of grade I varices, 25 cases were of grade II varices, 40 cases were in grade III varices and 4 cases were in grade IV varices. Maximum number of grade-III (22 patients) and grade IV (3patients) esophageal varices occurred in patients having platelet count less than 50000/mm^3. As the splenic size increases the grade of esophageal varices also increases. Maximum number of esophageal varices occur in grade II (25) followed by grade-III (37) in patients with splenic size in the range of 13 to 16 cm. **Conclusions:** A low platelet count and large splenic size are good non-invasive predictors of esophageal varices. These parameters can also accurately assess the presence of large varices. So a patient of cirrhosis with low platelet count and large spleen has an increased diagnostic yield of esophageal varices on upper GI endoscopy.

Key words: Platelet count, Splenomegaly, Esophageal varices.

INTRODUCTION

Hepatic cirrhosis is a common medical problem through out the world[1]. In western countries, the common cause of hepatic cirrhosis is alcohol intake while in Pakistan commonest cause of cirrhosis is related to virus. Among the hepatotropic viruses hepatitis B and hepatitis C are more commonly associated with cirrhosis[2-4]. Esophageal varices are common complication in cirrhotic patients[2-4]. Esophageal varices are dilated submucosal veins, develop in patients with underlying portal hypertension and may result in upper GI bleeding. Normally the pressure gradient between portal vein and inferior vena cava is 2-6mm of Hg. The gradient more than 12 mm of Hg gives rise to significant portal hypertension[5]. So esophageal varices when present they signify the development of portal hypertension[6]. Larger the varix the more likely is to bleed. The bleeding from esophageal varices accounts for 69 % of all cases of upper GI bleed in a study conducted in Nishtar Hospital, Multan[7] and 10% in another study[8]. Approximately 1/3rd of patients with compensated cirrhosis and 2/3rd of patients with decompensated cirrhosis have esophageal varices at the time of diagnosis[9]. About 30% of these patients experience an episode of upper GI variceal bleeding within one year of diagnosis[10-11]. Thrombocytopenia and splenomegaly are also associated with the development

of esophageal varices[12,13].

Thrombocytopenia in cirrhotic patients can occur due to portal hypertension, decreased survival of platelets, decreased level of thrombopoeitin and due to myelosuppression[14]. The level of platelet count is inversely related to grades of esophageal varices, lower the count higher is the grade of esophageal varices and more is the threat to rupture. Similarly the size of spleen is also correlated with esophageal varices. More the splenic size larger are esophageal varices. So the level of platelet and splenomegaly are non-invasive indirect ways which can help in prediction of development of esophageal varices and hence the present study was designed to see this association.

METHODOLOGY

It is a retrospective study carried out at Gastroenterology department, Medical unit III Nishtar Hospital, Multan. One hundred & ten cirrhotic patients were included. The Medical record of these patients was scrutinized and data collected was entered and analyzed through SPSS 11. The patients were divided into three groups according to level of platelet count. Group I with platelet count less than 50000/mm^3, group II with platelet count of 50000 to 100000/mm^3 and group III with platelet count of 100000 to 150000/mm^3 and in each group presence of esophageal varices along with grading was noted. Similarly patients were also divided into three groups according to splenic size. Group I with splenic size 11–13cm, group II with splenic size 13–16 cm and group III splenic size more than 16 cm and in each group presence of esophageal varices along with grading was noted.

RESULTS

One hundred and ten patients were included in this study. The age of the patients varied from 15 to 80 years and mean age was 48.55 ± 13.88 years. Sixty five (59.1 %) were male and 45 (40.9%) were female. The hemoglobin level of these patients varied from 6.0 to 14.3 gm/100 ml with mean level of 9.23 ± 2.11gm/100ml. The platelet count varied from 22000 to 385000/mm^3. Abdominal ultrasonography was done to measure the spleen size. The splenic size varied from 9 to 18 cm with mean of 12.53 ± 2.14 cm. All the patients underwent upper GI endoscopy.

Esophageal varices were detected in 102 cases. Seventeen cases were of grade I varices, 25 cases were of grade II varices, 40 cases were in grade III varices and 4 cases were in grade IV varices. As the platelet count in these patients decreased the grades of esophageal varices increased. Maximum number of grade-III (22 patients) and grade IV (3patients) esophageal varices occurred in patients having platelet count less than 50000/mm^3. As the splenic size increased the grade of esophageal varices also increased. Maximum number of esophageal varices occur in grade II (25) followed by grade-III (37) in patients with splenic size in the range of 13 to 16 cm. So there is a correlation between the low platelet count and the large splenic size with higher grade of esophageal varices. (table-I and table-II).

Table-I. Platelet count and Grades of Oesophageal varices

Platelet count (mm^3)	Grade I	Grade II	Grade III	Grade IV
<50,000	2	2	22	3
50, 000-100,000	3	8	12	1
100,001-150,000	12	15	8	-

Table-II. Splenic size and Grades of Oesophageal varices.

Splenic size (cm)	Grade I	Grade II	Grade III	Grade IV
11-13	2	12	15	1
13-16	4	25	37	2
>16	-	2	2	2

DISCUSSION

The development of esophageal varices is a common complication in cirrhotic patients[6]. An esophageal variceal bleed is a life threatening situation[6]. If we can predict the esophageal varices at an earlier stage then prophylactic measures to prevent their rupture can be adopted at an initial stage. Cirrhotic patients frequently undergo screening upper GI endoscopy for the detection of esophageal varices[12] which is a relatively invasive

procedure and is also not cost effective. To solve this problem there is a particular need for non-invasive parameters which can predict the presence of esophageal varices and might improve medical, social and economic outcomes. Many studies have been conducted on this subject. Child-Pugh score has also been described as a predictor of esophageal varices in one study[15], however not well supported by other studies. Several studies suggest that level of platelet count may predict the presence of esophageal varices in patients with hepatic cirrhosis[16-19]. In the present study we found as the platelet count decreases the chances of development of esophageal varices increase and hence this may help non-invasively in prediction of esophageal varices. Our study is also in consonance with the studies conducted by Zaman and Thompopoulos[17-18]. However, the platelet count in cirrhotics can be low due to several reasons and hence this single parameter i.e. platelet count is not solely reliable for the prediction of esophageal varices. Splenomegaly may be a good predictor of esophageal varices[16,18,20-21]. In present study we have noted that as the splenic size increases the chances of detection of esophageal varices also increase. Hence we can use this parameter for an early detection of esophageal varices and in this regard our results also favor the studies conducted by Madhootra and Sharma[20-21]. A study conducted by Giannini et al[12] showed that a composite parameters (platelet count/spleen diameter ratio) is a tool to detect non invasively the presence or absence of esophageal varices in cirrhotic patients. Our study also favors that if we take the composite parameters of platelet count and splenomegaly then it increases the yield for detection of esophageal varices and this finding favors the study by Gienninie et al[12]. However Wan has suggested with best cut off value of 1.0513 (10^9 /L), the platelet count/spleen width ratio yielded a low diagnostic accuracy of 60.3% and suggested that it is not an ideal predictor of esophageal varices[19]. In present study we have not calculated the platelet count/splenic width ratio and further studies are needed on this subject. Portal vein diameters more than 13 mm was one independent risk factors for development of esophageal varices[22]. This has not been included by us.

CONCLUSIONS

A low platelet count and large splenic size are good non-invasive predictors of esophageal varices. These parameters can also accurately assess the presence of large varices. So a patient of cirrhosis with low platelet count and large spleen has an increased diagnostic yield of esophageal varices on upper GI endoscopy.

REFERENCES

1. Taseer IH, Ishaq F, Hussain L, Safdar S, Mirbahar AM, Faiz SA. **Frequency of Anti-HCV, HBsAg and Related Risk Factors in Pregnant women at Nishtar Hospital, Multan.** J Ayub Med Coll Abbottabad 2010; 22(1): 13-16.

2. Qureshi H,Bile KM, Jooma R,Alam SE, Afridi HUR. **Prevalence of Hepatitis B and C Viral Infection in Pakistan: finding of a national survey appealing for effective prevention and control measures.** EMJH.2010 Supplement; 16:1-12.

3. Thomas PH, Lemon RS, Zuckerman PA. Eds. **Viral Hepatitis.** 3rd edition. Section IV 2005; 181-190.

4. Thomas PH, Lemon RS, Zuckerman PA. Eds. **Viral Hepatitis.** 3rd edition. Section-V 2005; 407-420.

5. McQuaid KR. Gastrointestinal disorders; In: McPhee SJ, Papadakis MA and Tierney LM. **Current Medical Diagnosis and treatment 2011.** McGraw Hill. 15th Edition; Chapter 15; 577-580.

6. Sherlock S, Dooley J. Eds. **Diseases of the liver and biliary system.** 11th edition, Chapter 10; 2002; 147-185.

7. Tanweer S, Inayatullah M and Arshad M. **Endoscopic evaluation of etiology of upper GI bleed.** Med Forum 2006; 17 (2): 7-9.

8. Abbasi A, Butt N, Bhutto AR, Munir SM. **Correlation of thrombocytopenia with grading of Esophageal varices in chronic liver disease patients.** J College of Physicians Surg Pak 2010; 20: 369-372.

9. Jenny L, Eulenia R, Nolasco ML, Venancio IG, Ernesto OD, Virgilio PB. **Clinical predictors of bleeding from oesophageal varcies: a retrospective study.** Phillipine J Gastroenterol 2006; 2: 103-11.

10. Paunescu V, Grigorean V, Popesco C. **Risk factors for immediate outcome of gastrointestinal bleeding in patients with cirrhosis.** Chirurgia (Bucur) 2004; 99: 311-

22.

11. Murachima N, Ikeda K, Kobayashi M, Saitoh S, Chayama K, Tsabuta A, et al. **Incidence of the appearance of the red colour sign on oesophageal varices and its predictive factors: long term observation of 359 patients with cirrhosis.** J Gastroenterol 2001; 36: 368-74.

12. Giannini E, Botta F, Borro P, Risso D, Romagnoli P, Fasoli A et al. **Platelet count/spleen diameter ratio: Proposal and validation of a non invasive parameters to predict the presence of Esophageal varices in patients with liver cirrhosis.** Gut 2003; 52 (8): 1200-1205.

13. Dib N, Konate A, Oberti F, Cales P. **Non-invasive diagnosis of portal hypertension in cirrhosis. Application to the primary prevention of varices.** Gastroenterol Clin Biol 2005; 29(10): 975-87.

14. Pech-Radosavljevic M. **Thrombocytopenia in liver disease.** Can J Gasteroenterol 2000; 14(Suppl D): 60-6D.

15. Thabut D, Trabut JB, Massard J, Rudler M, Muntenau M, Mesous D, Poynard T. **Non-invasive diagnosis of large oesophageal varices with Fibro Test in patients with cirrhfosis: a preliminary retrospective study.** Liver Int.2006;26:271-278.

16. Chalasani N, Imperiale TF, Ismail A, Sood G. Carey M, Wilcox CM, Madichetty H, Kwo PY, Boyer TD, **Predictors of large esophageal varices in patients with cirrhosis,** Am J Gastroenterol.1999:94:3285-3291.

17. Zaman A, Becker T, Lapidus J, Benner K, **Risk factors for the presence of varices in cirrhotic patients without a history of variceal hemorrhage.** Arch Intern Med.2001; 161:2564-2570.

18. Thomopoulos KC, Labropoulou-Karatza C, Mimidis KP, Katsakoulis EC, Iconomou G, Nikolopoulou VN. **Non-invasive predictors of the presence of large oesophageal varices in patients with cirrhosis.** Gig Liver Dis.2003; 35:473-478.

19. Hong W, Zhu Q, Huang Z, Chen X, Jiang Z, Xu S et al. **Predictors of esophageal varices in patients with HBV-related cirrhosis: a retrospective study.** Gastroenterology 2009; 9: 11.

20. Madhotra R, Mulcahy HE, Willner I, Reuben A. **Prediction of esophageal varices in patients with cirrhosis. Journal of clinical gastroenterology.** 2002; 34:81-85.

21. Sharma SK, Aggarwal R. **Prediction of large esophageal varices in patients with cirrhosis of the liver using clinical, laboratory and imaging parameters.** Journal of gastroenterology and hepatalogy. 2007; 22: 1909-1915.

22. Schepis F, Camma C, Niceforo D, Magnano A, Pallio S, Cinquegrani M, D'Amico G, Pasta L, Craxi A, Saitta A, et al. **Which patients with cirrhosis should undergo endoscopic screening for esophageal varices detection?** Hepatology. 2001; 33:333-338.

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Behind every argument is someone's ignorance.

(Louis D. Brandeis 1856 - 1941)