

Variceal Bleeding and its Dependence on Portal Vein Size in Liver Cirrhotic Patients

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Abstract: Upper gastrointestinal (GI) bleeding is common amongst liver cirrhosis having a meritorious cause of oesophageal varices due to portal hypertension. One-third of patients die because of bleeding oesophageal varices. In normal circumstances, ultrasound findings in portal system could predict both the presence of varices and risk of variceal bleeding which provides with contradictory results. In our study, 100 patients were assessed on the basis of portal vein size ranging from 1 cm to 2 cm. Out of which, 17 patients having portal vein size more than 1.4 cm bled. From the above study it is concluded that the patients who had portal vein size more than 1.4 cm were at a great risk of bleeding from oesophageal varices.

Key words: Variceal bleeding • Oesophageal varices • Portal vein • Diameter • Cirrhosis

INTRODUCTION

Oesophageal variceal bleeding is a life-threatening complication of cirrhosis [1]. In current clinical practice evolution of the risk of upper GI bleeding now based on endoscopy [1]. Although the upper GI bleeding varices and time of gastro-oesophageal bleeding in portal hypertension syndrome cannot be exactly predicted, however there are some endoscopic and clinical signs associated with the high risk of bleeding as, size of oesophageal varices, presence of cherry red spots and the severity of cirrhosis according to Child Pugh's classification [1-3].

Recent studies indicate that ultrasound findings in portal system could predict both the presence of varices and risk of variceal bleeding. Prihatini *et al.* [4] concluded in their study that portal vein size 1.2-cm on ultrasound gives the evidence of presence of oesophageal varices. Plestina *et al.* concluded in their study that portal vein size on ultrasound is independently associated with bleeding oesophageal varices [5].

In this study we investigated a possible predictive value of certain ultrasound parameters of portal vein for the assessment of risk of bleeding oesophageal varices with liver cirrhosis and portal hypertension by comparing ultrasonographic and upper GI endoscopic findings. Patients in this study can be prevented from

repeated, expensive and invasive procedure (endoscopy) for detection of bleeding oesophageal varices. Clinicians become alert by looking portal vein size (on ultrasonography) and take proper step to manage the patient cost effectively.

MATERIAL AND METHODS

This study was conducted at Medical Unit-IV, Liaquat University Hospital Jamshoro/Hyderabad from October 2003 to August 2005. 100 cirrhotic patients were selected by non-probability convenient sampling technique.

These 100 known cases of liver cirrhosis were diagnosed on basis of clinical history, examination, laboratory parameters and finally confirmed on liver biopsy. On the basis of endoscopy findings, bleeding and clotting time and platelets count we excluded the patients having congestive gastropathy and bleeding disorder. 64 were males and 36 were females. Forty-six cases were between 30 and 39 years of age, 39 cases were between 40 and 49 years and 19 cases were of age 50 years or above, with minimum age 30 years, maximum age 55 years and mean age 40.5 years (Fig. 1). As far as causes of cirrhosis were investigated by laboratory parameters, 61 patients were HCV positive, 11 were HBV positive, 12 were both HCV and HBV positive, while in 16 cases cause of cirrhosis could not be ascertained (Fig. 2).

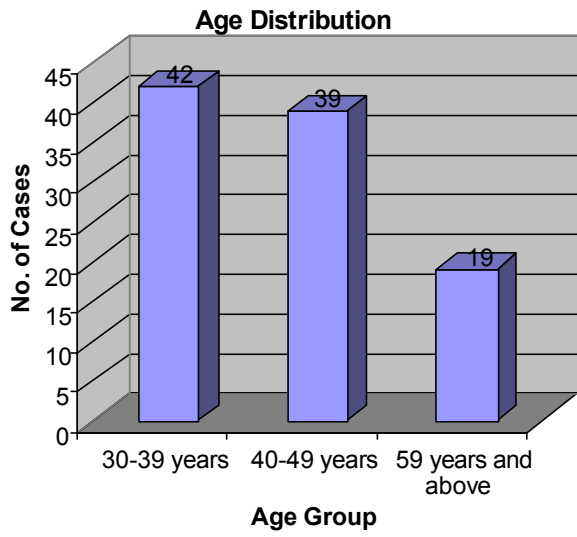


Fig. 1: Age distribution of Cirrhotic patients

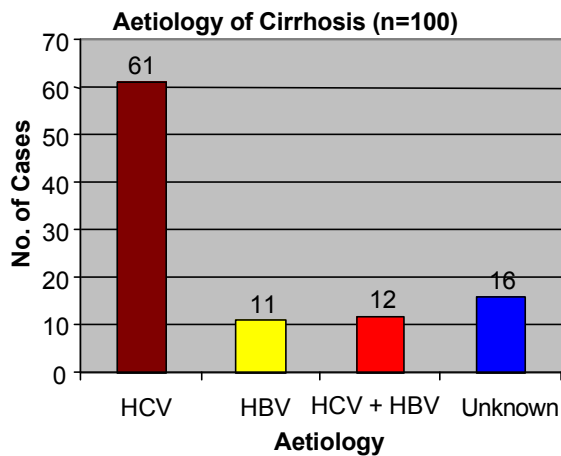


Fig. 2: Aetiology of Cirrhotic patients

Results were analysed using SPSS version 14 and student t-test was used to analyse the continuous data.

RESULTS

Clinical manifestation of these 100 patients were splenomegaly in 82, clinical jaundice in 78, ascites in 77, palmer erythema in 67, haemetemesis in 26, hepatic encephalopathy in 24, bleeding oesophageal varices in 17 (confirmed on endoscopy), gynaecomastia in 12, diabetes with HCV in 12, testicular atrophy in 9, diabetes with HBV in 5 cases. Out of one hundred patients there were 58 were males and 42 were females.

Portal vein size by ultrasonography was 1.1-cm in 8 cases, 1.2-cm 26 cases, 1.3-cm in 20 cases, 1.4-cm in 14 cases, 1.5-cm in 12 cases, 1.6-cm in 10 cases, 1.7-cm in 4 cases, 1.8-cm in 4 cases and 2-cm in 2 cases.

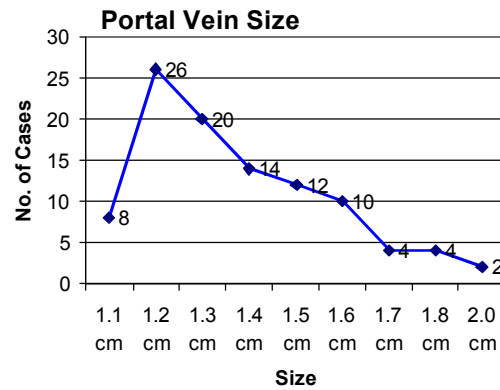


Fig. 3: Relationship of Portal Vein size in Cirrhotic patients Demographical Distribution (n=100)

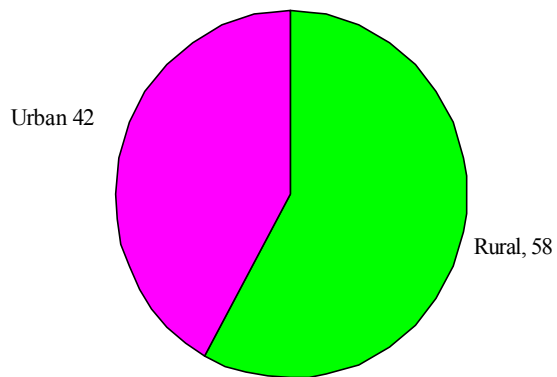


Fig. 4: Demographical distribution of cirrhotic patients (n = 100)

Minimum portal vein size was 1.1-cm and maximum was 2-cm, with the range on 0.9-cm and mean 1.38-cm (Fig. 3). This investigation was significant as Prihatini *et al.* [4] showed in their study that portal vein size 1.2-cm as non-invasive parameter to detect oesophageal varices in cirrhotic patients.

Spleen Size Was Also Studied: The size of spleen was 10.2-cm in 4, 11-cm in 2, 12.7-cm in 2, 13-cm in 2, 13.1-cm in 2, 14-cm in 10, 14.1-cm in 3, 14.2-cm in 5, 14.5-cm in 2, 15-cm in 2, 15.2-cm in 2, 15.5-cm in 2, 16-cm in 10, 17-cm in 4 and 18-cm in 6 cases. The minimal spleen size was 10.2-cm and maximum was 18-cm, with range of 7.8-cm and mean of 14.47-cm (Fig. 3). Patients who belonged to rural areas were 58 while 42 patients belonged to urban areas (Fig. 4).

Endoscopy was performed in 26 cases among which 9 had finding consistent with congestive gastropathy while 17 patients had oesophageal varices. Among these 17 patients 15 were males and 2 were females. The portal

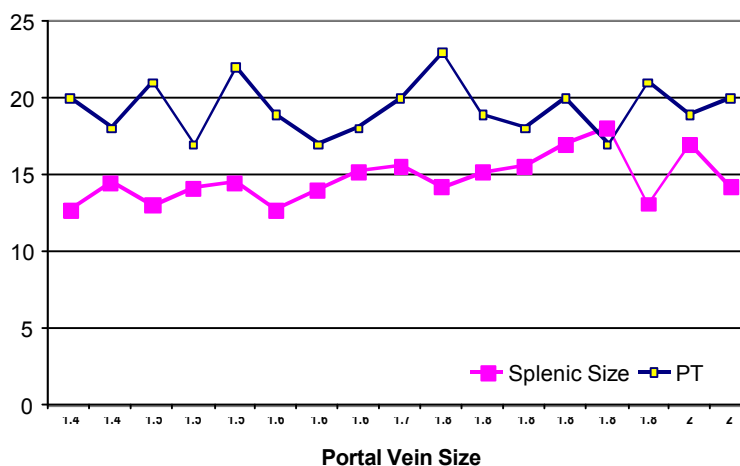


Fig. 5: Splenic size and portal Vein Size and number of cases in nCirrhotic patients

vein sizes in these 17 patients were 1.4-cm in 2, 1.5-cm in 3, 1.6-cm in 3, 1.7-cm in 3, 1.8-cm in 4 and 2-cm in 2 patients, with mean portal vein size of 1.7-cm.

In these 17 patients splenic sizes were 12.7-cm in 2, 13-cm in 1, 13.1-cm in 1, 14-cm in 1, 14.1-cm in 1, 14.2-cm in 2, 14.5-cm in 2, 15.1-cm in 1, 15.5-cm in 2, 17-cm in 2 and 18-cm in 1 patient (Fig. 5).

Prothrombin time of these 17 patients were 17-sec in 3, 18-sec in 3, 19-sec in 4, 21-sec in 2, 22-sec in 1 and 23-sec in 1, with mean prothrombin time of 19.4 seconds.

Amongst 100 cases of cirrhosis of liver 17 had oesophageal varices and mean size of portal vein was >1.4-cm while mean size of spleen was >12-cm.

These patients were managed as inpatients in Medical Unit-IV Liaquat University Hospital Hyderabad/Jamshoro. Twenty-six patients had haemetemesis out of 100 patients. They were given fluids in form of haemecle/blood transfusion and normal saline, thus their volume was replaced. Ocleriotide i.e. somatostatin/terlipressin and omeprazole infusion and vasodilator isosorbide mononitrate with or without Inderal (propranolol) were given according to their clinical status. Those who developed oesophageal varices were conservatively managed along with sclerotherapy on endoscopy.

Out of 100 patients 7 died due to multiple reasons including diabetes associated with HBV and HCV together. Among 17 cases of oesophageal varices 2 died due to uncontrolled bleeding.

DISCUSSION

Oesophageal variceal bleeding is mostly accounted for upper GI bleeding and also it is among the commonest

causes of death in cirrhotic patients [5]. The patients facing high risk of variceal bleeding are needed to be identified so that they can be kept under close surveillance and proper prophylactic measure may be taken, which include many specific pharmacological, endoscopic, radiological and surgical procedures [6]. In our set-up the widely adopted/best available tool for assessment of risk of variceal bleeding is endoscopy [15]. Despite the advantages of endoscopy, it is still an unpleasant and expensive invasive method. It also carries the risk of bleeding due to manipulation, especially in patients with large varices [7-9]. There are also other proven methods for assessment of risk of bleeding oesophageal varices, but they are rather invasive for frequent/routine use, lead to misdiagnosis, or are complex methods [2]. Hence there is a need of a non-invasive but accurate and specific method to assess the risk of variceal bleeding. Monitoring of portal vein size by ultrasonography offers an easy, frequently available, non-invasive yet reliable and cost effective way to evaluate the patients with cirrhosis for the risk of variceal bleeding [5, 10, 11]. It can be used for diagnosis as well as long-term clinical monitoring of patients with portal hypertension, which is very important for the follow-up of these patients [5, 9].

In this study 17 patients found to be having oesophageal varices by endoscopy. We used these results to confirm the ultrasonographic findings of portal vein size and found that the mean portal vein size of these patients was 1.4-cm. The increase in size of portal vein significantly indicated the oesophageal varices, as also observed by Prihatini *et al.*, [4] who found portal vein size of 1.5-cm as predictive factor for oesophageal varices in cirrhotic patients [4]. Using the endoscopic findings as

gold standard, Plestina *et al.*, [5] observed that portal vein size had significant diagnostic value and patients with mean portal vein size of 1.5-cm were at high risk of bleeding [5]. Other authors have also advocated the use of ultrasound in predicting variceal bleeding, like Baik *et al.*, [12] and Franchis *et al.*, [13-14] have proposed ultrasonography for primary prevention as well as for prediction of recurrent variceal bleeding.

CONCLUSION

Portal vein size is good for predicting bleeding oesophageal varices and those patients whom portal vein size more than 1.4-cm are at great risk of bleeding oesophageal varices. By simple ultrasonography non-invasively these patients should be offered for optimal measures to prevent them from bleeding oesophageal varices. These patients should be kept under close surveillance and prescribed propranolol and vasodilator (isosorbide dinitrate) with proton pump inhibitors to prevent them for bleeding oesophageal varices.

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