

FREQUENCY OF PORTAL VEIN THROMBOSIS IN CIRRHOSIS ON ULTRASOUND

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ABSTRACT

Objective: To determine the frequency of portal vein thrombosis on ultrasound in patients presenting with cirrhosis.

Material and Methods: This study was cross sectional including 140 patients, conducted at Radiology Department, Khyber Teaching Hospital, Peshawar from August 2010 to February 2011.

Results: In this study, out of 140 participants, Portal Vein Thrombosis was found in 20 patients presenting with cirrhosis liver on ultrasound, resulting in prevalence of 14%.

Conclusion: Portal vein thrombosis is a substantial clinical, economic and social problem which mostly goes unrecognized unless routine screening with ultrasound of patients with cirrhosis is performed.

Key Words: Portal vein, thrombosis, ultrasound, cirrhosis liver.

INTRODUCTION

Portal vein thrombosis is not a rare disease to find these days. Previous studies show an overall risk in general population of 1% to develop portal vein thrombosis during lifetime¹. Common causes of the portal vein thrombosis are cirrhosis, malignancy, major abdominal infections, inflammatory diseases and myeloproliferative disorder². It is encountered in 10-25% of cirrhotic patients³. Various studies support a thrombotic potential in cirrhosis despite an increase risk of bleeding, so hypercoagulability plays an important role in it⁴. Portal vein thrombosis has mortality of 13% in one year which depends upon the cause⁵.

Cirrhosis is a serious and irreversible disease. Common causes of cirrhosis are hepatitis B virus and hepatitis C virus infections in our country^{6,7}. Cirrhosis presents with ascites, splenomegaly, variceal bleeding, encephalopathy, portal vein thrombosis and hepatocellular carcinoma as common complications. Careful monitoring of cirrhotic patients is achieved by a combination of regular clinical evaluation and imaging.

Ultrasound plays an important role in evaluation of cirrhosis and its complications. It is a cheap, noninvasive, widely available method for early assessment. Color Doppler ultrasound is a valuable tool for detecting portal vein thrombosis and decisive

diagnostic role, thus making potentially harmful invasive diagnostic procedures unnecessary⁸⁻¹⁰. The only limitation is the need of an expert operator for diagnosis. Fresh thrombus is difficult to detect on sonography as it is of low echogenicity but it can be recognized on color Doppler ultrasound as absent flow¹⁰.

The aim of my study is to determine the frequency of portal vein thrombosis on ultrasound in cirrhotic patients. There has been increased incidence of portal vein thrombosis in our society in the past few years due to increasing cirrhosis. Portal vein thrombosis thus needs to be diagnosed and treated early to prevent its major complications of varices, portal hypertensive gastropathy and bleeding. This study has never been done before in our department so by conducting it I will help to establish diagnosis of portal vein thrombosis with the help of ultrasound in patients presenting with cirrhosis. By doing this study I will provide basic trends and statistics about the frequency of portal vein thrombosis in cirrhosis in our region as no such data is available. This data will help clinicians to advise regular screening of cirrhotic patients with the help of cheap, non invasive, easily available ultrasound which is very sensitive and specific for diagnosing portal vein thrombosis. Early diagnosis will also help clinician to start the treatment early and thus reduce major fatal complications.

MATERIAL AND METHODS

This study was conducted at Radiology department of Khyber Teaching Hospital, Peshawar from August 2010 to February 2011. It was a cross sectional study in which non-probability purposive sampling was used. Sample size was 140, using 10%

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frequency of portal vein thrombosis, 95% confidence interval and 8% margin of error, under WHO software for sample size determination.

All age patients, with cirrhosis liver on ultrasound, of both genders, were included in the study. Patients with primary hepatocellular carcinoma, hepatic metastasis, history of trauma, abdominal infections, hypercoagulable conditions, dehydration and shock, portal vein invasion or compression by external pathology like extrahepatic tumors and acute pancreatitis were not included. These conditions act as confounders and if included, would introduce bias in the study, permission was taken from hospital's ethical Committee. All patients meeting the inclusion criteria were identified. The cirrhotic patients were identified on the basis of clinical features of jaundice, ascites, splenomegaly and spider naevi and previous ultrasound findings of irregular liver shape, shrunken liver, increased echogenicity of liver, nodular liver surface, ascites, splenomegaly. The purpose and use of the study was told and explained to the patient. It was explained that the confidentiality of the patient would be maintained. Written informed consent was taken from them.

A Proforma was filled recording name, age, sex, ultrasound findings of cirrhosis and presence or absence of portal vein thrombosis on grey scale, colour and flow Doppler ultrasound. Ultrasound was done using 3.5MHz probe of Siemens Sonoline G50. Grey scale and Color Doppler study of the portal vein performed by an expert radiologist. Any bias or confounding variable was controlled by strictly following exclusion criteria.

Data analysis was done by using SPSS version 10. Mean \pm standard deviation was calculated for all numerical values i.e. age. Frequency and percentage were calculated for all categorical/qualitative variables i.e. sex and portal vein thrombosis. Portal vein thrombosis was stratified among age and sex to see the effect modifiers. Results were presented in the form of tables and graphs.

RESULTS

In total 140 patients of all age ranges with mean age of 50 years \pm 1.27. Most of the subjects 74(53%) were aged between 51-60 years. 45(32%) patients were in age range 41-50 years, 12(9%) patients were in age range 31-40 years, 6(4%) patients were in age range

Table 1: Gender Distribution (n=140)

Gender distribution	Frequency & percentage
Male	81 (58%)
Female	59 (42%)
Total	140 (100%)

21-30 years and 3(2%) patients were less than 20 years. Genderwise distribution is shown in Table 1.

DISCUSSION

Portal vein thrombosis is relatively uncommon disease in general population, but it is more frequent among cirrhosis liver patients specially with advanced disease and presents an important complication in natural evolution of liver disease. It is associated with serious morbidity and mortality. Chronic Hepatitis B and C are important causes of cirrhosis liver worldwide¹¹. As symptoms are usually missing, the diagnosis is accidentally made by abdominal Ultrasound with Doppler examination.

In our study 53% patients were in age ranged 51-60 years. In this study incidence of portal vein thrombosis on ultrasound was 14% while portal vein thrombosis was not found in 86% patients. Similar results were found in study done by Tsochatzis EA et al³ and Ogren M et al¹ in which the incidence of Portal Vein Thrombosis was encountered 10-25% and 18% respectively. Senzolo M⁴ the same concept in his study in which out of 40 portal vein thrombosis patients 25 were in the age range of 50-60 years, 15 were in age range 42-50 years.

Whereas the number of male patients were more as compared to female patients as (58% vs 42%). Similar findings were found in study done by Sogaard KK et al¹² in which 60% were in age ranged 51-60, also male patients were comparatively more than female patients as (62% vs 38%).

When the age and gender of subjects were analyzed, it was found that portal vein thrombosis was more common in age group 51-60 years, and moreover it was more common in male as 14 male patients had portal vein thrombosis as compare to 6 female patients. Similar observations were also recorded in another study conducted by Rossi S et al¹⁰.

No previous study provided frequency data on Portal Vein Thrombosis on ultrasound in cirrhosis liver patients in this region^{11,12}. Being carried out in a tertiary care hospital, the study sample may not be a true representative of all portal vein thrombosis patients as it does not address portal vein thrombosis in primary care.

CONCLUSION

The detection of Portal vein thrombosis by Ultrasound in patients with cirrhosis is a moderately sensitive but highly specific sign. It is cheap, non invasive, easily available.

RECOMMENDATIONS

Therefore, it is recommended to replicate the study in primary care to ensure the generalization of the

finding to the whole population. Also a larger sample of population should be taken to additionally assess the risk factors for portal vein thrombosis.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Aman N: Concept, data analysis, data compilation, writing and discussion.

Gul H: Concept, drafting the manuscript.

Roghani IS: Final approval of the version to be published.

Afridi Z: Data collection

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST: Authors declare no conflict of interest

GRANT SUPPORT AND FINANCIAL DISCLOSURE NIL

The Journal of Medical Sciences, Peshawar is indexed with WHO IMEMR (World Health Organisation Index Medicus for Eastern Mediterranean Region) and can be accessed at the following URL.

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