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General Medicine

ROLE OF DUPLEX DOPPLER ULTRASOUND IN EVALUATION OF PORTAL VENOUS HYPERTENSION

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ABSTRACT

OBJECTIVES:

1. To diagnose and establish the causes of Portal hypertension.
2. To evaluate the spectrum of Duplex Doppler sonographic findings and study flow metric changes in Portal hypertension.
3. To look for the presence of various porto systemic collaterals.

MATERIAL AND METHODS:

The present study was conducted with a sample size of 50 for about 18 months from August 2021 to January 2023 . All clinically suspected or diagnosed cases of portal hypertension who were satisfied for inclusion criteria referred to the Department of General Medicine were subjected for study. Pediatric and pregnant cases were excluded from the study. Initially using gray scale, abdomen was scanned and findings noted. Later color doppler was used along with duplex Doppler to study flow metric changes. Diameter of portal vein was considered enlarged if it was above 13mm. Upper limit of spleen size was taken as 12cms.Flow metric changes and various porto systemic collaterals were identified using grayscale and color Doppler ultrasound. Other significant findings if any in abdomen were noted. **RESULTS:** Males were more predominantly affected than females with majority of cases in the age group 51-65 years. Dilated portal vein >13mm was seen in only 64% of cases proving it to be less reliable criteria for diagnosing portal hypertension. Respiratory variation in portal vein diameter noted. 70 -90% of flow was hepatopetal whereas hepatofugal flow was 2-8%.10-36 % of veins showed thrombosis. Splenomegaly and ascites were frequent findings seen in 84% and 80% cases respectively. Most frequent collaterals were gastro esophageal and splenorenal group seen in 80 % and 60 % cases respectively. About 66 % of cases were cirrhotics and next frequent cause was portal vein occlusion seen in 14% cases. **CONCLUSION:** The present study clearly demonstrates various benefits of US in the etiology, diagnosis and complications of portal hypertension.

KEYWORDS : Portal hypertension; hepatofugal flow

INTRODUCTION

Portal hypertension is the hemodynamic abnormality frequently associated with serious liver disease, although it is recognized less commonly in a variety of extra hepatic diseases also. Portal hypertension can be sinusoidal, pre sinusoidal and post sinusoidal.In majority of cases portal hypertension is seen as a major complication of cirrhosis. It can further lead to life threatening complications like variceal bleeding & acute or chronic hepatic encephalopathy. So accurate diagnosis helps in timely implementation of surgical and medical management. Ultrasonography with Duplex Doppler helps in evaluation of portal hypertension. It can permit differentiation of sinusoidal, pre or post sinusoidal cause of portal hypertension. It also allows to look for sequelae like portal vein thrombosis, oesophageal varices with reasonable accuracy.Colour Doppler sonography is a non-invasive, cost-effective, requires no radiation, most rapid, widely available ,easy to follow up and is presently the initial imaging of choice.Hence purpose of study is to study the role of Duplex Doppler sonography in portal hypertension.

OBJECTIVES

- To evaluate the spectrum of Duplex Doppler sonographic findings and study flow metric changes in portal hypertension.
- To look for the presence of various porto-systemic collaterals.
- To diagnose and establish the causes of portal hypertension.

MATERIAL AND METHODS

Type Of Study : Cross -sectional study
Place of study: Department of General Medicine , TRRIMS, Inoule, Hyderabad
Study duration: 18 months (August 2021 to January 2023)
Sample size : 50

Inclusion criteria: All cases with clinical diagnosis of portal hypertension Adult cases (cases in the age group of 20-65yrs).

Exclusion criteria: Paediatric age group cases. Pregnant cases.

Tools Used : All patients included in the study underwent ultrasonography of abdomen using a curvilinear probe of 3.5 - 5.0 MHZ coupled with color Doppler equipment in PHILIPS AFINITI 50 and GE LOGIC F8 EXPERT ultrasound machines.

Statistical Tests: Statistical analysis was done using percentage and proportions.

METHODOLOGY

Initially using gray scale, abdomen was scanned and findings noted.Later color doppler was used along with duplex Doppler to study flow metric changes.Diameter of portal vein was considered enlarged if it was above 13mm.Upper limit of spleen size was taken as 12cms.Flow metric changes and various porto systemic collaterals were identified using grey scale and Color Doppler ultrasound. Other significant findings if any in abdomen like ascites , cirrhotic changes of liver were noted. Age and Sex distribution were noted.

Fig 1. Direction of flow in portal vein

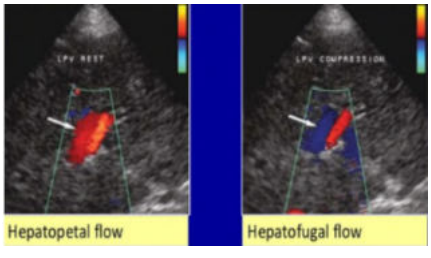
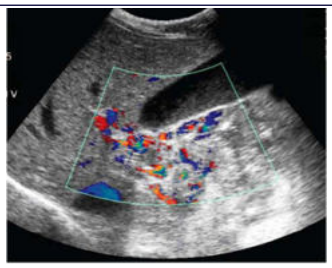


Table 1. Direction of flow in portal vein

Flow	No	%
Petal	36	72
To and fro	2	4
Fugal	1	2
No flow	11	22

Fig 2. Collaterals veins



RESULTS

50 cases of portal hypertension were studied using Duplex Doppler ultrasonography. Various parameters of portal hypertension were observed.Males were more predominantly affected than females with majority of cases in the age group 51-65 years. Dilated portal vein >13mm was seen in only 64% of cases proving it to be less reliable criteria for diagnosing portal hypertension.Splenomegaly and ascites are most of the time associated with portal hypertension. It was seen in 84% and 80% cases respectively.70 to 90 % cases had hepato petal flow. Hepatofugal and bidirectional to and fro flow though less common are significant findings. 10-36 % of veins showed thrombosis.Portosystemic collaterals, are almost always associated with portal hypertension. Splenorenal,Gastro oesophageal and paraumbilical veins were more frequent.Cirrhosis is by far the most common cause for portal hypertension followed by portal vein occlusion. Hence colour doppler ultrasonography is non invasive investigation tool which shows various spectrum of findings, flow metric changes and collaterals accurately in portal hypertension.

CONCLUSION

The present study clearly demonstrates various benefits of Duplex Doppler ultrasound in the early diagnosis and complications of portal hypertension like portal vein thrombosis ,esophageal varices etc. . Because of a close relationship with impaired porto hepatic venous system hemodynamics, Doppler measurement data is useful to understand the underlying pathogenesis in the portal venous system. However, as the currently available parameters are not definitive indicator for HVPG, continuous efforts are required to determine the appropriate Doppler markers.

REFERENCES

1) Grossman RJ, Franchis R. Portal Hypertension. In : Schiff ER, Sorrell MF, Maddreg WC, edrs., Schiff's Disease of the Liver. 8th edn. Philadelphia: Lippincott Raven 1999:p.387-442.
2) Ditchfield MR, Gibson RN, Donald JD, Gibson PR. Duplex Doppler Ultrasound sign of portal hypertension. Relative diagnostic value of examination of paraumbilical vein, portal vein and spleen. Australasian Radiology 2007. 2008March;36(2):102-105.
3) Ralls PW. Colour Doppler sonography of the Hepatic artery and portal venous system. AJR 1990Sept;155:517-25.
4) Barkat M. Portal vein pulsatality and spectral width changes in patient with portal hypertension: Relation to the severity of liver diseases. BJR 2002Feb;75:417-421.
5) Herbay Av, Frieling T, Haussinger D. Color Doppler sonographic evaluation of spontaneous portosystemic shunts and invesion of portal venous. JCU 2000Sep.;28(7):332-339.