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Shalini Shree H
Pharm D Interns, Department of Pharmacy Practice, PES University, Bengaluru, Karnataka, India

Yashwanth C
Pharm D Interns, Department of Pharmacy Practice, PES University, Bengaluru, Karnataka, India

Anu Jayram
Pharm D Interns, Department of Pharmacy Practice, PES University, Bengaluru, Karnataka, India

R Srinivasan
Chairperson, Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, PES University, Bengaluru, Karnataka, India

Corresponding Author:
R Srinivasan
Chairperson, Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, PES University, Bengaluru, Karnataka, India

Assessment of Etiology, complication and management of portal hypertension in adults - A Multicenter study

Shalini Shree H, Yashwanth C, Anu Jayram and R Srinivasan

Abstract
Back ground: Treatment of portal hypertension is evolving based on randomised controlled trails. In acute variceal bleeding, prophylactic antibiotics are mandatory, reducing mortality as well preventing infections. The main aim of our study is to understand the etiological reasons, complications and management of Portal Hypertension (PH), in order to reduce the mortality and morbidity rate and to improve the quality of life of the patients.
Objectives: The objectives of our study were to assess the etiological factors in adults with portal hypertension, to assess the further complications of portal hypertension and to find out the current standard treatment options for portal hypertension.
Methodology: The present study was a prospective observational study. The study included 120 patients which included assessing the etiology, complications and management of portal hypertension from the medical records.
Results: Out of 120 adult patients, males (85.83%) were more predominantly affected over females (14.16%). i.e., so older adults (45-60) are more likely prone to develop PH when compared to young adults (18-30) and middle age adults (31-45). Alcoholics (57.50%) were more prone to the PH than smokers (28.33%). In gender distribution males 103(85.83%) were predominantly diagnosed with portal hypertension than females 17 (14.16%).
Conclusion: A prospective observational study was conducted on assessment of etiology, complications and management was successfully carried out in 120 patients with portal hypertension. From our study we concluded that out of all participants males were predominantly diagnosed with portal hypertension than females and in age group distribution older adults were more prone to portal hypertension than younger adults. The most common sign and symptom of portal hypertension, was identified as abdominal pain in majority of patients. Also the study revealed that alcoholics were more likely to get affected from the disease than smokers.

Keywords: Portal hypertension (PH), etiology, complication, abdominal pain, hepatic venous pressure gradient (HVPG).

Introduction
Portal hypertension (PH) is a clinical syndrome defined by a portal venous pressure gradient exceeding 5mmHg. Cirrhosis is the most common cause of portal hypertension in the World. Portal hypertension is a part of dynamic process triggered by chronic liver disease, mostly induced by alcohol or incorrect nutrition and less often by viral infections and autoimmune or genetic disease. It is also defined as the pathological increases of portal venous pressure, mainly due to chronic end stage liver disease, leading to augmented hepatic vascular resistance and congestion of the blood in the portal venous system.
Portal hypertension is the major complication of cirrhosis and it is responsible for complications such as massive gastrointestinal bleeding, ascites, hepatorenal syndrome and Hepatic encephalopathy. Clinically significant portal hypertension is defined above the threshold of 12mmhg due to potential development of portal hypertensive bleeding, the most serious complication of portal hypertension, as it is associated with high morbidity and mortality rate. It is an almost unavoidable complication of cirrhosis, and it is responsible for more lethal complications of the syndrome: gastroesophageal varices and massive gastrointestinal bleeding, ascites, hepatorenal syndrome and hepatic encephalopathy. HVPG which accurately reflects portal pressure in the majority of liver disease is the most commonly used method to access portal pressure in clinical access.
Portal hypertension is the increase in Portosystemic Pressure Gradient in any portion of the portal venous system. Although portal hypertension could result from prehepatic abnormalities (example: portal or splenic vein thrombosis) post hepatic abnormalities

(example: Budd-Chiari syndrome) or intra hepatic non cirrhotic causes (example: schistosomiasis, sinusoidal obstruction syndrome), cirrhosis is by far the most common cause of portal hypertension and as such has been the most widely investigated. In cirrhosis the Porto-systemic gradient is assessed by measuring the wedged hepatic venous pressure (a measure of sinusoidal hepatic pressure) and substracting the free hepatic venous pressure (systemic pressure) thus obtaining the Hepatic Venous Pressure Gradient (HVPG). The normal HVPG is 3-5mmHg.

An HVPG above 5mmHg defines portal hypertension, however an HVPG of 10mmHg or greater defines clinically significant portal hypertension as this pressure gradient predicts clinical course in patients with cirrhosis including development, clinical decompensation (i.e., development of ascites, variceal hemorrhage and encephalopathy), Decompensation or death after liver resection and Hepatocellular carcinoma.

Portal hypertension is detrimental complication resulting from obstruction of portal blood flow, such as cirrhosis or portal vein thrombosis in liver cirrhosis; increased intra-hepatic vascular resistance to the portal flow elevates portal pressure and leads to portal hypertension. Once portal hypertension develops it influences extra-hepatic vascular beds in the splanchnic and systemic circulation, causing collateral vessel formation and arterial vasodilation. This helps to increase the blood flow in to portal vein, which exacerbates portal hypertension and eventually brings the hyperdynamic circulatory syndrome consequently oesophageal varices or ascites develops.

Aim

The main aim or intention of this study is to provide an overview of underlying etiological, factors, complications and management of portal hypertension.

Objectives

- To assess the etiological factors in adults with Portal hypertension.
- To assess the further complications of portal hypertension.
- To find out the current standard treatment options for Portal Hypertension.

Materials and Methods

Study site

Sparsh Hospitals, Bengaluru, Karnataka, India and S.N.R Government Hospital, Kolar, Karnataka, India.

Study design

This is a prospective observational study.

Study period

The study will be carried out for a period of six months.

Study criteria

Inclusive criteria

- Patients with portal hypertension and with its complications.
- Patients >18 yrs and <60yrs.
- All types of liver diseases.

Exclusion criteria

- Patients <18 yrs and <60yrs old are excluded**.**
- Other co-morbidities like cancer, hypothyrodisim, liver transplantation, psychiatric patients.

Source of data

The data were collected from treatment chart, laboratory report and patient medical records.

Study procedure

It was a prospective observational study carried out for a period of 6 months in hospitalised portal hypertension patients admitted in the Hepatology department. All the patients with portal hypertension admitted in the hepatology department of both sex have been included in this study cases were reviewed by the clinical pharmacists and those who met the study criteria were followed and patient's details including drug therapy were recorded in the suitable designed data collection form.

Data collection form

The data collection form was developed by referring available literatures and objective requirements. It includes patient demographics, current complaints, past medical/medication history, social habits, physical examination, laboratory data, clinical presentation, current and discharge medication.

Documentation

- The data collected from the patients was documented for further analysis.
- Microsoft excel software is used for statistical analysis.

Results

A prospective observational study was conducted over a period of 6 months at Sparsh Hospitals and S.N.R Govt. Hospital. During the study, 120 patients were enrolled and diagnosed with portal hypertension.

Table 1: Age distribution

Age	Number of patients	Percentage
Old adults (45-60)	67	55.83%
Middle age adults (31-45)	44	36.66%
Young adults (18-30)	9	7.50%

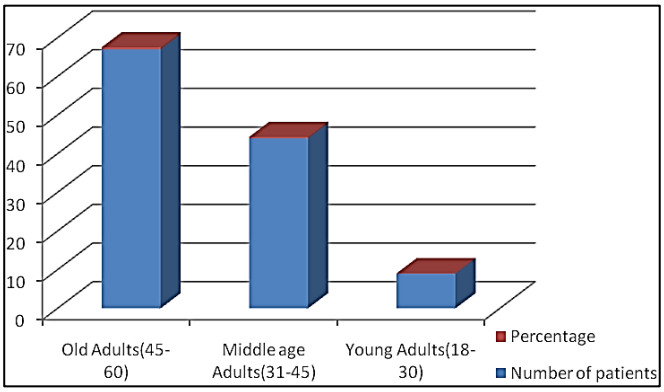

Fig 1: Age distribution

Table 1 and Figure 1 depicts that out of 120 patients involved the percentage of old adults (55.83%) was found to be more than middle age adults and when compared to young adults middle age adults percentage was found to be more. Therefore old adults are more likely prone to portal hypertension.

Table 2: Gender distribution

Sex	Number of patients	Percentage
Male	103	85.83%
Female	17	14.16%

Table 2 and Figure 2 depicts that out of 120 patients involved the percentage of male (85.83%) was found to be more when compared to females (14.16%). Therefore males are found to be predominant gender.

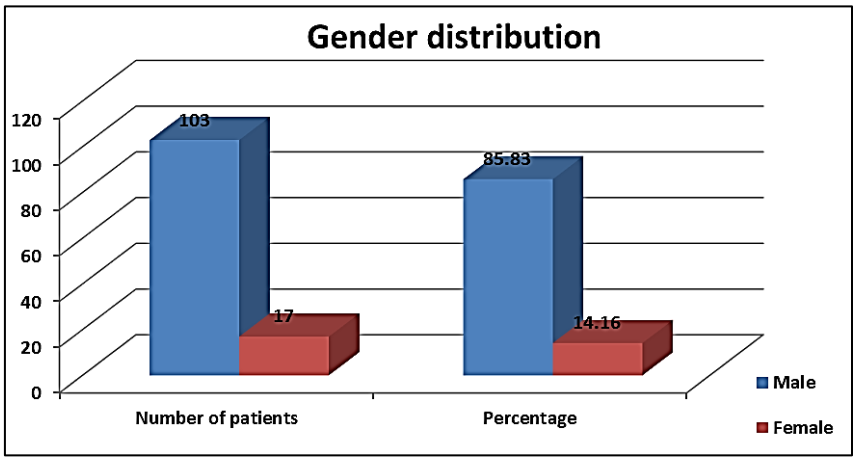

Fig 2: Gender distribution

Table 2 and Figure 1 depicts that out of 120 patients involved the percentage of male (85.83%) was found to be more when compared to females (14.16%). Therefore males are found to be predominant gender.

Table 3: Signs and symptoms

Signs and symptoms	No. of patients	Percentage
Abdominal pain	66	55%
Fever	34	28.33%
Vomiting	28	23.30%
Abdominal distension	14	12%
Generalised weakness	12	10%
Melena	9	7.50%
Hematemesis	9	7.50%
Diarrhea	7	5.83%
GI bleeding	2	1.60%
Jaundice	2	1.60%

Table 3 and Figure 3 represents the abdominal pain (55%) was the frequent problem faced in the patients.

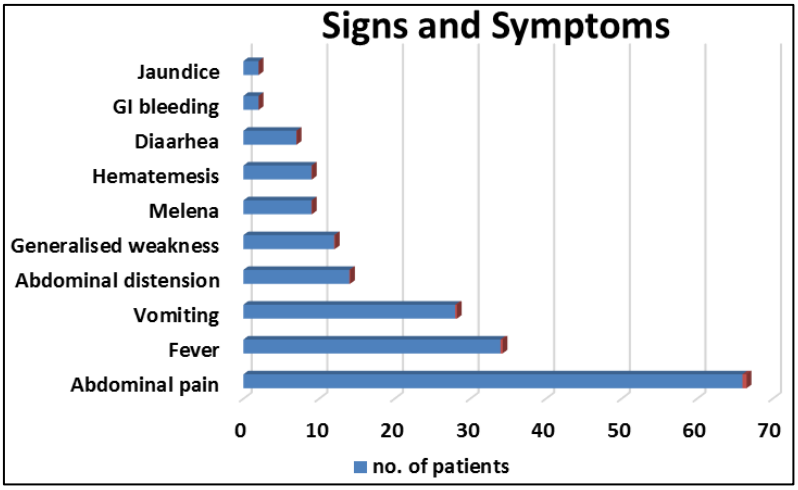

Fig 3: Signs and symptoms

Table 4: Social habits

Social Habits	No. of patients	Percentage
Alcoholic	69	57.50%
Smoker	34	28.33%
Not known	17	14.16%

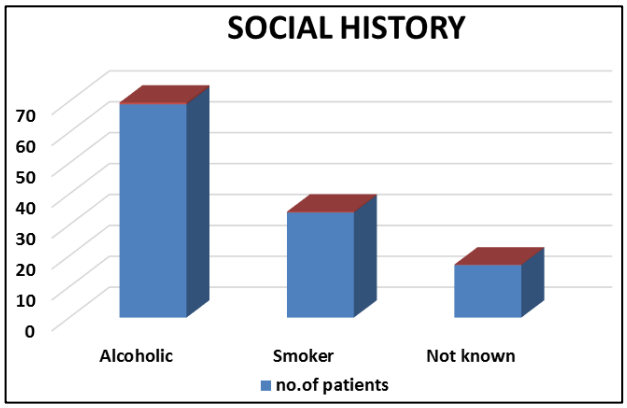

Fig 4: Social habits

Table 4 and Figure 4 depicts that alcoholics (57.50) were more prone to the portal hypertension than smokers (28.33).

Table 5: Diagnosis

Tests	Number of patients	Percentage
USG abdomen	63	54.16
CT scan	28	23.33
2D echo	13	10.83
Gastroduodenoscopy	10	8.33
Endoscopy	8	6.66

Table 5 and Figure 5 shows that USG abdomen 63 (54.16%) was the most common diagnosis done for the patients when compared to other diagnosis.

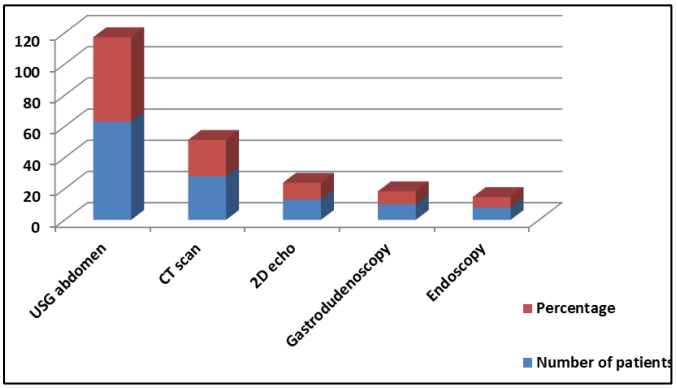

Fig 5: Diagnosis

Table 6: Co-morbidities

Co-morbidities	No. of patients	Percentage
Chronic liver disease	42	35%
Alcoholic liver disease	39	32.50%
Decompensated liver disease	18	15%
Cirrhosis of liver	14	11.66%
Ascites	14	11.66%
Hepatitis	12	10%
Hepatic Encephalopathy	4	3.33%
Liver abscess	2	1.66%

Table 6 and Figure 6 depicts that chronic liver disease (35%) was found to be one of the major co-morbidity in these patients.

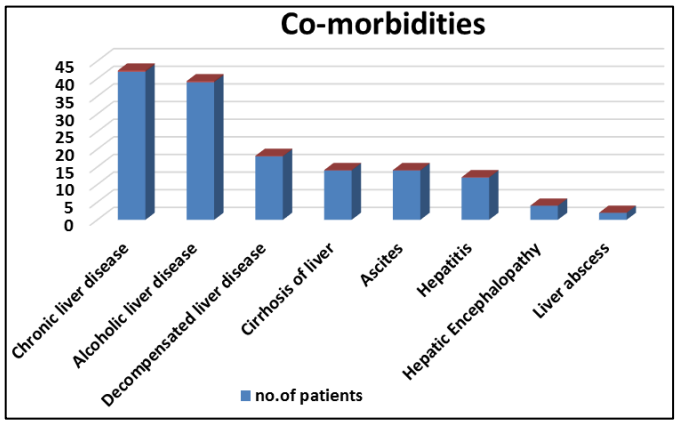

Fig 6: Co-morbidities

Table 7: Common drug administered to the patient

Drugs	No. of patients exposed	Percentage
L-Ornithine-L-aspartate	46	38.33%
Ursodeoxy cholic acid	43	35.83%
Ranitidine	41	34.16%
Multivitamin (Vit-K)	26	21.66%
Lactitol	23	19.16%
Multivitamin (Vit-K)	21	17.50%
Spiranolactone	19	15.83%
Sucralfate	11	9.16%
Rifaxmin	8	6.66%

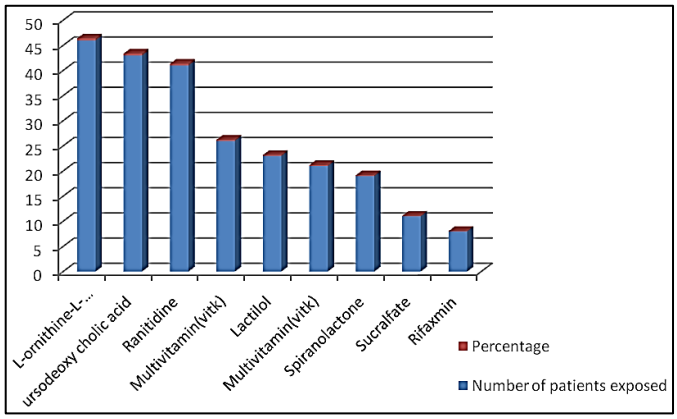

Fig 7: Common drug administered to the patient

The commonly prescribed drug for portal hypertension was found by calculating the total number of drugs from the Table 7 and Figure 7 the most prescribed drug was L-Ornithine-L-Aspartate (Hepamerz) 46 (38.33%).

Discussion

Older adult patients were addressed with more portal hypertension when compared with younger population. Hepamerz is a drug of choice for liver disease. Majority of the patients were from socio-economic and cryptogenic chronic liver disease was found to be the predominant cause of portal hypertension. This requires the pharmacist to intervene and develop strategies aimed towards better patient care and improving the quality of life of the patients in adults.

As shown in Table 1 and Figure1 in the current study: out of total number of 120 patients were analysed. The percentage of old adults 67 (55.83%) (45-60years) was found to be more than middle age adults 44 (36.66%) (31-45years) and when compared to young adults 9 (7.5%) (18-30years). Therefore old adults are more likely prone to PH.

As shown in Table 2 and Figure 2 males 103 (85.83%)

showed higher percentage occurrence of PH when compared to females 17(14.16%) therefore males were found to be predominant gender when compared to females.

From the study etiology of portal hypertension may influence gastrointestinal transit by R.Sadik et.al. showed that etiology of liver disease and gender may influence transit in patients with portal hypertension.

All the patients profile forms were analysed to find the signs and symptoms of PH. From Table 3 and Figure 3 abdominal pain was found to be the major sign and symptoms with the total number of 66 (55%) cases presented with the common symptom of abdominal pain followed by fever 34 (28.33%).

Table 4 and Figure 4 shows that alcoholics 69 (57.50%) were more prone to portal hypertension when compared with smokers 34 (28.33%).

From the study of managing portal hypertension in patients with liver cirrhosis by Tilman Sauerbruch et.al. shows that portal hypertension is one of the causes and a part of a dynamic process triggered by chronic liver disease mostly induced by alcohol or incorrect nutrition.

Table 5 and Figure 5 shows that the USG abdomen 63 (54.16%) was the most common diagnosis done for the patients when compared to other diagnosis.

From a study conducted on approach to the diagnosis of portal hypertension by Christopher Koh et.al showed that the portal hypertension can be diagnosed by imaging techniques such as Doppler ultrasonography, computed tomography.

Table 6 and Figure 6 represents that chronic liver disease 42 (35%) was found to be one of the major co-morbidity in the portal hypertension patients.

From the study of advances and challenges of portal hypertension by Annalisa Berzigotti et.al. showed that, Chronic liver disease affects 300 million people worldwide and the main causes of chronic liver disease are alcohol abuse, chronic viral hepatitis and metabolic factors.

Table 7 and Figure 7 shows the most commonly prescribed drug L-Ornithine-L-Asparatate (Hepamerz) 46 (38.33%) for portal hypertension.

Conclusion

A prospective observational study on assessment of etiology, complications and management was successfully carried out in 120 adult patients with portal hypertension.

From our study we concluded that out of all participants males were predominantly diagnosed with portal hypertension than females and in age group distribution older adults were more prone to portal hypertension than younger adults. The most common sign and symptom of portal hypertension was identified as abdominal pain in majority of patients. Also the study revealed that alcoholics were more likely to get affected from the disease than smokers. Chronic liver disease was the one of the major co-morbidity which was found in majority of portal hypertension patients and the most commonly prescribed drug for portal hypertension with liver disease patients was found to be L-Ornithine-L-Aspartate (Hepamerz).

From this study, a conclusion can be drawn that reduction of complications and providing specific causes and standard treatment is the most efficient step to prevent portal hypertension and its complications.

We counsel the participants and provide necessary knowledge regarding the disease, medications self-monitoring and important dietary life style modifications for improving the quality of life in patients suffering from portal hypertension.

Limitations

- The period of study was six months which was very limited to carryout observations in a wider aspect.
- Information of specific treatment was limited.
- Language was the communication barrier for interacting with patients.

Future Directions

- The study can be carried out in a larger population by creating multiple study sites to obtain a more data.
- Improved characterization of pathophysiology and discovery of new therapeutic targets need to be done for better clinical assessment of portal hypertension with the inclusion of epidemiology.

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Conflicts of Interest

The author declares that there is no conflict of interest to disclose.

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