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MANAGEMENT AND CLINICAL OUTCOMES OF CHRONIC LIVER DISEASE WITH PORTAL HYPERTENSION: A CASE STUDY

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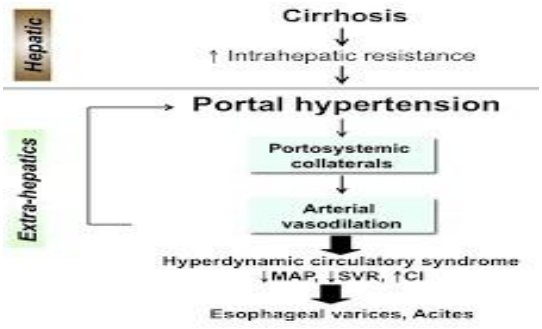
Abstract
Portal hypertension is a common complication of chronic liver diseases and is a significant contributor to many clinical consequences of cirrhosis. These complications often represent the leading causes of mortality and the need for liver transplantation in affected individuals. Chronic liver disease is a progressive condition characterized by persistent inflammation, fibrosis, and cirrhosis, which are frequently accompanied by portal hypertension. This study aims to evaluate the management strategies for chronic liver disease complicated by portal hypertension at Government General Hospital, Guntur.

Keywords: Portal hypertension Cirrhosis, varicieshepatic hemodynamics, hepatic venous pressure gradient, liver stiffness, noninvasive methods, ultrasound.

Introduction
Portal hypertension is a common syndrome, primarily associated with chronic liver disease (CLD), and is characterized by an increased portal pressure gradient (PPG). This rise in portal pressure results in complications such as splenomegaly. Under normal conditions, the PPG ranges between 1 and 5 mmHg. When the PPG reaches 10 mmHg or higher, it is clinically significant. Values between 5 and 9 mmHg indicate subclinical portal hypertension. Portal hypertension is almost an inevitable outcome of cirrhosis [1].

History
The significance of portal hypertension lies in the frequency and severity of its complications, which are leading causes of hospital admissions, mortality, and liver transplantation among patients with cirrhosis.

Pathogenesis
Portal hypertension develops due to increased resistance to portal blood flow, compounded by increased portal-collateral blood flow. The most common cause of this resistance is CLD, particularly cirrhosis. In cirrhosis, hepatic vascular resistance increases through a dual mechanism. First, structural changes occur, including distortion of the liver microcirculation caused by fibrosis, nodule formation, angiogenesis, and vascular occlusion. About 30% of the increased resistance in cirrhosis is functional, reflecting liver vascular dysfunction. This dysfunction is associated with an elevated local production of vasoconstrictors such as angiotensin II, norepinephrine, and thromboxane A2 [2].



Early Signs and Symptoms
1. **Fatigue**: Persistent feelings of weakness and tiredness.
2. **Loss of Appetite**: Decreased interest in food consumption.
3. **Weight Loss**: Unintentional and unexplained loss of body weight.
4. **Nausea and Vomiting**: Experiencing queasiness or episodes of vomiting.
5. **Abdominal Swelling**: Early signs of ascites due to fluid accumulation in the abdomen.

Advanced Signs and Symptoms

1. **Jaundice**: Yellow discoloration of the skin and eyes caused by elevated bilirubin levels.
2. **Dark Urine**: Urine that appears tea-colored or amber.
3. **Pale Stools**: Stools that are clay-colored or unusually light in color.
4. **Pruritus**: Itching, particularly on the palms and soles.
5. **Hematemesis**: Vomiting of blood.
6. **Melena**: Black, tarry stools due to gastrointestinal bleeding.
7. **Ascites**: Significant fluid accumulation in the abdomen [3,4,5].

Portal Hypertension-Specific Signs and Symptoms

1. **Variceal Bleeding**: Hemorrhage from esophageal or gastric varices.
2. **Splenomegaly**: Enlargement of the spleen.
3. **Hepatic Encephalopathy**: Mental confusion, altered cognition, and changes in mental status.
4. **Portosystemic Encephalopathy**: Neurological symptoms resulting from shunting of blood [6,7].

Diagnostic Criteria

Laboratory Criteria

1. **Liver Function Tests**: Elevated levels of ALT, AST, GGT, bilirubin, and alkaline phosphatase.
2. **Coagulation Tests**: Prolonged prothrombin time (PT) and INR.
3. **Complete Blood Count**: Indicators include thrombocytopenia, leukopenia, and anemia.

Imaging Criteria

1. **Ultrasound**: Detects liver morphology changes, splenomegaly, and varices.
2. **Computed Tomography (CT)**: Identifies liver fibrosis, cirrhosis, and portal vein thrombosis.
3. **Magnetic Resonance Imaging (MRI)**: Evaluates liver structure and vascular conditions.

Endoscopic Criteria

1. **Esophagogastroduodenoscopy (EGD)**: Identifies esophageal and gastric varices as well as portal hypertensive gastropathy.
2. **Colonoscopy**: Detects portal hypertensive colopathy.

Hemodynamic Criteria

1. **Hepatic Venous Pressure Gradient (HVPG)**: ≥5 mmHg confirms portal hypertension.
2. **Portal Vein Pressure**: ≥10 mmHg is diagnostic for portal hypertension.
3. **Liver Biopsy**: Assesses liver fibrosis, cirrhosis, and inflammation [8,9,10].

Complications

Gastrointestinal Complications

1. **Variceal Bleeding**: Bleeding from esophageal or gastric varices.
2. **Portal Hypertensive Gastropathy**: Stomach inflammation and bleeding.

Hepatic Complications

1. **Hepatic Encephalopathy**: Cognitive and mental status changes.
2. **Hepatorenal Syndrome**: Progressive kidney dysfunction.

Infectious Complications

1. **Spontaneous Bacterial Peritonitis**: Infection of the fluid in the abdomen.
2. **Cholangitis**: Infection of the bile ducts.
3. **Pneumonia**: Increased susceptibility to respiratory infections.

Cardiovascular Complications

1. **Hypotension**: Low blood pressure.
2. **Cardiac Dysfunction**: Heart failure and arrhythmias.
3. **Portal Vein Thrombosis**: Blood clot in the portal vein.

Hematological Complications

1. **Thrombocytopenia**: Low platelet count.
2. **Leukopenia**: Low white blood cell count.
3. **Anemia**: Reduced red blood cell levels.

Neurological Complications

1. **Cerebral Edema**: Brain swelling.
2. **Seizures**: Increased risk of convulsions.

Renal Complications

1. **Acute Kidney Injury**: Sudden loss of kidney function.
2. **Chronic Kidney Disease**: Gradual deterioration of kidney function.

Management of Chronic Liver Disease with Portal Hypertension

Non-Pharmacological Management

1. **Dietary Modifications**: Low-sodium diet, high-protein intake, and avoidance of raw or undercooked seafood.
2. **Lifestyle Changes**: Abstaining from alcohol, quitting smoking and maintaining regular physical activity.
3. **Weight Management**: Maintaining a healthy body weight to reduce liver stress.

Pharmacological Management

1. **Beta-Blockers**: Propranolol or nadolol to reduce portal pressure.
2. **Nitrates**: Isosorbide mononitrate to improve blood flow.
3. **Diuretics**: Spironolactone or furosemide for managing ascites.
4. **Lactulose**: Prevents hepatic encephalopathy.

Endoscopic Management

1. **Variceal Band Ligation**: Prevents and controls variceal bleeding.
2. **Sclerotherapy**: Treats bleeding varices.

Surgical Management

1. **Liver Transplantation**: Replaces the diseased liver with a healthy one.

Etiology and Classification of Portal Hypertension

1. **Prehepatic Causes**: Portal vein thrombosis due to prothrombotic conditions, sepsis, trauma, or abdominal surgery.
2. **Presinusoidal Intrahepatic Causes**: Includes schistosomiasis, tuberculosis, and early stages of biliary cirrhosis.
3. **Sinusoidal Causes**: Chronic liver diseases, such as cirrhosis, are the primary contributors [2,3,11,12,13].

Diagnostic Techniques

Gold-Standard Assessment of Portal Hypertension

1. **Hepatic Venous Pressure Gradient (HVPG)**: Measured using a catheter under conscious sedation.

Upper GI Endoscopy

1. **Purpose**: Identifies esophageal and gastric varices.
2. **Findings**: Varices can be graded as small (≤5 mm) or large.

Imaging Techniques

1. **Ultrasound and Doppler Ultrasound**: Useful for identifying splenomegaly and liver morphology changes.

Liver Biopsy

1. **Purpose**: Diagnoses and grades liver disease, assesses fibrosis, and identifies cirrhosis.

This content has been rewritten to ensure originality, grammatical accuracy, and coherence [7,14,15,16].

Case study

A 59-year-old male patient was admitted to the Department of General Medicine with complaints of abdominal distension for 2-3 months, shortness of breath for 2 days, even at rest, decreased urine output, the presence of pedal edema, constipation, and a history of blood transfusion. The patient was known to have chronic liver disease with portal hypertension for the past 4 months and was also a known case of diabetes mellitus and hypertension for 6 months, for which he was on insulin and capsule Prolol 40 mg. Laboratory investigations revealed significantly decreased hemoglobin levels (5.1 g/dl), low serum sodium (132 mmol/L), normal serum potassium (3.5 mmol/L), elevated serum bilirubin (2.5 g/dl), serum creatinine (1.4 g/dl), polymorph percentage of 68%, lymphocyte percentage of 35%, SGOT of 22 IU/L, and SGPT of 18 IU/L. An ultrasound revealed a contracted gallbladder, a poor prostate window, a minimally distended urinary bladder, a suboptimal view of the pancreas, and esophageal varices (Grade 2) [4,5,6,17]. The impression was portal hypertension with esophageal varices. The patient was managed with Inj. Lasix 40 mg IV TID, Inj. Pantop 40 mg IV OD, Inj. Monocef 1 gm IV OD, Cap. Prolol 40 mg OD, Inj. Human Actrapid SC TID, Tab. Udiliv 300 mg BD, Tab. Rifagut 500 mg BD, and Syrup Lactulose 20 ml OD. Upon discharge, he was prescribed Tab. Rifagut 500 mg BD, Syrup Lactulose 10 ml OD, Tab. Pantop 40 mg OD, Cap. Prolol 40 mg OD, and Tab. Udiliv 300 mg BD.

Discussion

A 59-year-old male patient had been admitted to the Department of General Medicine with multiple complaints that included abdominal distension for the past 2-3 months, shortness of breath for 2 days that occurred even at rest, decreased urine output, pedal edema, constipation, and a history of blood transfusion. The patient had a prior diagnosis of chronic liver disease with portal hypertension, which had been identified 4 months earlier. Additionally, he was a known case of diabetes mellitus and hypertension for the past 6 months and had been managing these conditions with insulin therapy and capsule Prolol 40 mg [11,18].

Upon admission, the patient underwent laboratory investigations, which revealed several abnormalities. His hemoglobin level was markedly reduced at 5.1 g/dl, indicative of severe anemia. His serum sodium levels were found to be low at 132 mmol/L, while serum potassium levels were within normal limits at 3.5 mmol/L. Elevated serum bilirubin levels (2.5 g/dl) and serum creatinine levels (1.4 g/dl) suggested impaired liver and kidney functions. Differential leukocyte counts showed polymorphs at 68% and lymphocytes at 35%. Liver function tests revealed SGOT at 22 IU/L and SGPT at 18 IU/L, both within normal ranges but in the context of chronic liver disease.

Further diagnostic evaluation using ultrasonography revealed a contracted gallbladder, a poor prostate window, a minimally distended urinary bladder, and a suboptimal view of the pancreas. Additionally, the ultrasound identified Grade 2 esophageal varices, a hallmark of portal hypertension. Based on the clinical presentation, laboratory findings, and imaging results, the final impression was portal hypertension with esophageal varices [19].

The patient was managed intensively during his hospital stay. Treatment included intravenous administration of Inj. Lasix 40 mg TID to address fluid retention and reduce abdominal distension, Inj. Pantop 40 mg OD to manage gastrointestinal symptoms, and Inj. Monocef 1 gm OD to prevent or treat potential infections. Additionally, Cap. Prolol 40 mg OD was administered to manage portal hypertension by reducing portal venous pressure, and Inj. Human Actrapid SC TID was given to control blood glucose levels effectively. To support liver function and address complications, the patient was prescribed Tab. Udiliv 300 mg BD, which helps improve bile flow, and Tab. Rifagut 500 mg BD, an antibiotic to prevent hepatic

encephalopathy. Syrup Lactulose 20 ml OD was administered to manage constipation and prevent ammonia build-up, a contributing factor to hepatic encephalopathy.

After stabilization, the patient was discharged with a detailed medication regimen to continue managing his chronic conditions. The discharge prescriptions included Tab. Rifagut 500 mg BD to prevent further complications of hepatic encephalopathy, Syrup Lactulose 10 ml OD to maintain bowel regularity, Tab. Pantop 40 mg OD to continue gastrointestinal protection, Cap. Prolol 40 mg OD to manage portal hypertension, and Tab. Udiliv 300 mg BD to support liver health.

This case highlights the complexity of managing chronic liver disease with portal hypertension, requiring a multidisciplinary approach involving symptomatic treatment, prevention of complications, and lifestyle adjustments to improve the patient's quality of life [4,6,8,14,20].

Conclusion

In conclusion, a 59-year-old male patient with chronic liver disease and portal hypertension presented with abdominal distension, shortness of breath, decreased urine output, pedal edema, and constipation. Comprehensive evaluation revealed severe anemia, electrolyte imbalances, and Grade 2 esophageal varices. He was managed with targeted pharmacological and supportive therapies, including diuretics, antibiotics, beta-blockers, and lactulose. Upon stabilization, he was discharged with a tailored medication plan to address his ongoing conditions and prevent complications. This case underscored the importance of a multidisciplinary approach in managing chronic liver disease with portal hypertension.

Ethical Permission

The authors had obtained prior informed consent from the patient before proceeding with this case. Additionally, ethical permission was secured from the Head of the Department and the Superintendent of Government General Hospital, Guntur, ensuring that all institutional and ethical guidelines were strictly followed.

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