"STUDY OF SPECTRUM OF PRECIPITATING FACTORS OF HEPATIC ENCEPHALOPATHY IN CIRRHOSIS OF LIVER WHICH IS A CROSS SECTIONAL STUDY FOR 1 YEAR AT KLES DR PRABHAKAR CORE CHARITABLE HOSPITAL BELAGAVI"

BY

REGISTER NUMBER: BG0121006

Dissertation

Submitted to

KAHER, Belagavi, Karnataka,

In partial fulfilment of the requirements for the degree of

M.D.

IN

GENERAL MEDICINE

DEPARTMENT OF GENERAL MEDICINE
JAWAHARLAL NEHRU MEDICAL COLLEGE,
KAHER, BELAGAVI – 590010
KARNATAKA.

DECEMBER-2024 / JANUARY -2025

KLE Academy of Higher Education and Research Belagavi , Karnataka

Endorsement

This is to certify that the dissertation entitled,

"STUDY OF SPECTRUM OF PRECIPITATING FACTORS OF HEPATIC ENCEPHALOPATHY IN CIRRHOSIS OF LIVER WHICH IS A CROSS SECTIONAL STUDY FOR 1 YEAR AT KLES DR PRABHAKAR CORE CHARITABLE HOSPITAL BELAGAVI" is a bonafide research work done by REG NO. BG0121006.

DR REKHA S PATIL M.D.
Professor & Head
Department of General Medicine
J N Medical College
KAHER
Belagavi, Karnataka
Date: 25/06/24
Place: JNM, Belagavi

KAHER BELAGAVI J.N. MEDICAL COLLEGE

DR N S MAHANTASHETTI M.D.
Principal
J N Medical College
KAHER
Belagavi, Karnataka
Date: 25/6/24
Place: JNMC, Belagavi

PRINCIPAL
J.N. Medical College,
BELAGAVI- 590 010

KLE Academy of Higher Education and Research Belagavi, Karnataka

UNDERTAKING

I, **REG NO.: BG0121006** hereby declare that the information and data mentioned in my dissertation entitled **"STUDY OF SPECTRUM OF PRECIPITATING FACTORS OF HEPATIC ENCEPHALOPATHY IN CIRRHOSIS OF LIVER WHICH IS A CROSS SECTIONAL STUDY FOR 1 YEAR AT KLES DR PRABHAKAR CORE CHARITABLE HOSPITAL BELAGAVI"** belongs to me and is original. I am aware of the definition of plagiarism as detailed below:

- An act or instance of using or closely imitating the language and thoughts of another author without authorization and the representation of that author's work as one's own, as by not crediting the original author.
- A piece of writing or other work reflecting such unauthorized use or imitation.
- The deliberate or reckless representation of another's words, thoughts or ideas as one's own without attribution in connection with submission of academic work whether graded or otherwise. I hereby declare that the dissertation prepared by me is original one and does not involve plagiarism anywhere. In case at a later stage, it is found that I have indulged in plagiarism, then I am solely responsible for the same and the institution is at liberty to take any disciplinary action against me including cancellation of dissertation or any other penalties imposed by the University

Date:

Place: JNMC, Belagavi **REG NO.: BG0121006**

PLAGIARISM ACCEPTANCE LETTER

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH

JAWAHARLAL NEHRU MEDICAL COLLEGE

(A constituent unit of KLE Academy of Higher Education & Research Deemed-to-be-University)

(Recognized by National Medical Commission, New Delhi)

Accredited 'A+' Grade by NAAC (3rd Cycle) **Placed in Category 'A' by MoE (GoI)**

Nehru Nagar, Belagavi- 590 010, Karnataka, INDIA

0831 - 2471350 0831 - 2470759 www.jnmc.edu rincipal@jnmc.edu

Ref No: MDC/PG/ Date: 20-06-2024

"ACCEPTANCE LETTER"

The softcopy of thesis entitled: **"STUDY OF SPECTRUM OF PRECIPITATING FACTORS OF HEPATIC ENCEPHALOPATHY IN CIRRHOSIS OF LIVER WHICH IS A CROSS SECTIONAL STUDY FOR 1 YEAR AT KLES DR PRABHAKAR CORE CHARITABLE HOSPITAL BELAGAVI"** has been submitted for Anti-Plagiarism check through Turnitin software. The scan has been carried out and the scanned output reveals a match percentage of **05%** which is within the acceptable limits of **10%** as per the guidelines given by UGC.

Guide.

KAHER BELAGAVI J. N. MEDICAL COLLEGE

Dr. (Mrs.) N.S. Mahantashetti.
Chairperson-Antiplagiarism Committee &
Principal,
J. N. Medical College, Belagavi.

PRINCIPAL
J.N. Medical College,
BELAGAVI- 590 010

To,
Reg. No. BG0121006
Postgraduate Student,
2021-22 Batch,
Department of General Medicine.
J. N. Medical College, Belagavi.

ETHICAL CLEARANCE LETTER

K.L.E. ACADEMY OF HIGHER EDUCATION AND RESEARCH
(Deemed to-be-University)
Accredited 'A++' Grade by NAAC in 3rd Cycle Placed in Category 'A' by MHRD (GoI)
JNMC INSTITUTIONAL ETHICS COMMITTEE
JAWAHARLAL NEHRU MEDICAL COLLEGE,
NEHRU NAGAR, BELAGAVI-590010 (KARNATAKA-INDIA)
Website: http://www.jnmc.edu
E-Mail : dome@jnmc.edu
Phone (+91-(0)831 Office : 2472550
Principal 2471701
Fax No. +91 (0)831 – 2470759

Ref No.MDC/JNMCIEC/ 116 **Date: 27/09/2022**

To.
REG NO.: BG0121006
PG Student in General Medicine,
J. N. Medical College,
BELAGAVI.

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"STUDY OF SPECTRUM OF PRECIPITATING FACTORS OF HEPATIC ENCEPHALOPATHY IN CIRRHOSIS OF LIVER WHICH IS A CROSS SECTIONAL STUDY FOR 1 YEAR AT KLES DR PRABHAKAR CORE CHARITABLE HOSPITAL BELAGAVI."**, is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee.

(Dr. Smita Sonoli)
Member Secretary
JNMC Institutional Ethics Committee
J.N.Medical College, Belagavi.

(Dr. Harsha Hegde)
Chairman,
JNMC Institutional Ethics Committee
J.N.Medical College, Belagavi

LIST OF ABBREVIATIONS

HE	:	Hepatic encephalopathy
Rho	:	Spearman’s rank correlation coefficient
PET	:	Positron emission tomography
EEG	:	Electroencephalogram
MHE	:	Minimal hepatic encephalopathy
DSM IV	:	Diagnostic and statistical manual of mental Disorders
CHE	:	Covert hepatic encephalopathy
CLD	:	Chronic liver disease
TIIPS	:	Trans-jugular intrahepatic porto systemic shunt
GFAP	:	Glial fibrillary acidic protein
MAO	:	Mono amino oxidase
FDG	:	Fluoro deoxy glucose
GABA	:	Gama amino butyric acid
CPS	:	Child pugh score
Cps	:	Centipoise
NMDA	:	N-methyl D-aspartic acid
NH3	:	Ammonia
CMRA	:	Cerebral metabolic rate for ammonia
PS	:	Permeability surface area product
CBF	:	Cerebral blood flow
AAA	:	Aromatic amino acid
BCAA	:	Branched chain amino acid
5HT	:	5-hydroxy tryptamine
BZ	:	Benzodiazepine

PTBR	:	Peripheral type benzodiazepine receptor
SIRS	:	Systemic inflammatory response syndrome
PSE	:	Porto systemic encephalopathy syndrome test
AASLD	:	American association for study of liver disease
OHE	:	Overt hepatic encephalopathy
GCS	:	Glasgow coma scale
ALD	:	Alcoholic liver disease
EVL	:	Endoscopic variceal band ligation
LDH	:	Lactate dehydrogenase
GPB	:	Glyceryl phenyl butyrate
LOLA	:	L-Ornithine L-Aspartate
PP	:	Portal pressure
PSS	:	Porto Systemic shunt
VB	:	Variceal Bleeding
LT	:	Liver transplantation
WHC	:	West-haven classification
SBP	:	Sub acute bacterial peritonitis
UTI	:	Urinary tract infection
PT	:	Prothrombin time
APTT	:	Activated partial thromboplastin time
TLC	:	Total leucocyte count

ABSTRACT

Background and Objectives:

Hepatic encephalopathy (HE) is a neuropsychiatric disorder that is caused by liver disease in the absence of other neurological disorders. Liver cirrhosis and its complications are a major health problem in the developing countries where cost of health care is high. This study aims to ascertain the spectrum of precipitating factors of hepatic encephalopathy in patients with cirrhosis of liver.

Methods

128 cases of cirrhosis of liver who presented in hepatic encephalopathy admitted to department of general medicine at KLE Dr. Prabhakar Kore Hospital and Research Centre, Belagavi , between January 2023 and December 2023 were studied . All patients of more than 18 years of age , presenting with signs of HE were included. History and examination was done to grade encephalopathy . Investigations were done and recorded on a proforma. Prognostic stratification was done by Child Pugh score . Correlation between variables was done by using Pearson' s correlation test. P-value < 0.05 was taken as level of significance.

Results :

The study focuses on cirrhosis of the liver , noting hepatitis B virus (HBV) and hepatitis C virus (HCV) infections as significant causes. The study population primarily consists of males (92%) aged predominantly between 41-60 years. Clinical features commonly observed include jaundice, edema feet, and abdominal distension. Alcoholism is prevalent among 38% of the study population. Viral hepatitis,

particularly HBV (20%) and HCV (6.06%), is also identified as causes of cirrhosis. The study reports various laboratory findings such as elevated liver function tests (LFTs) and alterations in hemoglobin, platelet count, and renal function markers. Encephalopathy is prevalent, with Grade 2 being the most common (34%), followed by Grades 4 (26%) and 3 (20%). The study also identifies precipitating factors for hepatic encephalopathy (HE), including electrolyte imbalances, infections, constipation, gastrointestinal bleeding, and urinary tract infections. Ammonia levels correlate with the severity of encephalopathy, with higher grades associated with elevated ammonia levels. The study concludes by comparing its findings with previous research, highlighting differences in precipitating factors and clinical profiles across different regions and studies. Overall, the study provides a comprehensive overview of cirrhosis , emphasizing its multifactorial etiology, clinical manifestations, and associated complications such as hepatic encephalopathy.

Conclusion:

Electrolyte imbalance, Infection, Upper GI Bleed and Constipation were the most common precipitating factors of HE in this study.

Key words: Hepatic encephalopathy; Liver cirrhosis; Precipitating factors.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

IST OF GRAPHS

INTRODUCTION

As we see in day-to-day practice cirrhosis of liver is one of the commonest occurrences among the array of diseases. Even though Hepatic Encephalopathy (HE) is a complex but potentially reversible neuropsychiatric condition that occurs as a consequence of acute or chronic liver disease. It is also called as portosystemic encephalopathy characterized by altered mental status and cognitive function. It is one of the dreadful and few times an easily treatable complication of cirrhosis of liver. Early and prompt identification of well-defined precipitating factors is extremely important in diagnosis and treatment of this potentially reversible and prevent the fatality.

Gut derived neurotoxins that are not removed by the liver because of vascular shunting and decreased hepatic mass get into the brain and cause the symptoms which resemble neuropsychiatric condition. Even though in our subcontinent infectious cause like chronic hepatitis B and C are common the number of cases detected with cirrhosis are probably less. This may be because of not routinely checking for Hepatitis C antibody in clinical practice. HE is clinically important because it is a potentially reversible condition. There are identifiable precipitating factors for HE which upon treatment reverts back to normalcy thereby improving the encephalopathy. Clinical examination is very important as few precipitating factors are easily identified clinically. In unselected population approximately 30% to 45% of patients with cirrhosis will exhibit clinically apparent neuropsychiatric abnormality and are classified as overt HE. 22% to 75% although apparently neuropsychiatrically unimpaired on clinical examination will show significant abnormalities in both

psychometric and neuropsychological performance and are classified as having minimal hepatic encephalopathy (MHE).

In developing countries such as India, liver diseases continue to pose a significant health problem. The increasing burden of chronic liver diseases and their complications significantly impacts the economy. Hepatic encephalopathy, a serious neuropsychiatric disorder, occurs in liver dysfunction patients without brain disease constituting hepatic encephalopathy. According to recent WHO data, liver diseases account for 2.95% of total deaths in India . India ranks 63rd globally in age-adjusted death rates, with 22.93 deaths per 100,000 population due to liver diseases.

Hepatic encephalopathy, also known as portosystemic encephalopathy (PSE), is a reversible syndrome of impaired brain function in patients with advanced liver failure. It is associated with poor survival and a high risk of recurrence, and even in its mildest form, significantly reduces health-related quality of life. Subtle signs of HE are observed in nearly 70% of patients, while overt hepatic encephalopathy occurs in about 30-45% of patients with cirrhosis.

In chronic liver diseases, ammonia is normally produced by bacteria in the gastrointestinal tract through the breakdown of amines, amino acids, purines, and urea, followed by metabolism and clearance by the liver. However, in cirrhosis or advanced liver dysfunction, there is a decrease in the number of functioning hepatocytes or portosystemic shunting, or both, resulting in impaired liver detoxification and hyperammonemia. HE is characterized by a spectrum of neuropsychiatric abnormalities due to the accumulation of neurotoxic substances in the bloodstream, ultimately building up in the brain. The correlation between ammonia levels and the grade of HE has shown contradicting results .

Most episodes of HE in patients with cirrhosis are due to clinically apparent precipitating factors or the spontaneous development of portosystemic shunting. Common precipitating factors include gastrointestinal bleeding, infections, hypovolemia, azotemia, constipation, electrolyte imbalance, and high-protein diet. Infections and GI bleeding are the most frequently documented precipitating factors in the literature. The development of encephalopathy in patients with chronic liver disease is a poor prognostic sign, but this complication can be managed in most patients, as hepatic encephalopathy in cirrhosis is usually reversible. However, patient outcomes rely on the early identification of the precipitating cause that led to deterioration.

This study aims at studying the clinical profile of precipitating factors of HE in cirrhosis of liver so that we can identify them at the earliest and initiate the appropriate treatment that can bring down the morbidity and mortality.

AIMS AND OBJECTIVES

Objective of the study

1. To study the clinical profile of hepatic encephalopathy in chronic liver disease.
2. To study the clinical spectrum of precipitating factors of hepatic encephalopathy in patients with cirrhosis of liver.
3. To study the correlation between venous blood ammonia level to severity of hepatic encephalopathy.

REVIEW OF LITERATURE

Cirrhosis

Cirrhosis is an irreversible process. Cirrhosis is defined by the World Health Organization (WHO) as a diffuse process characterized by fibrosis and the conversion of normal liver architecture into structurally abnormal nodules.

It results from different mechanisms of liver injury that lead to necroinflammation and fibrogenesis; histologically it is characterized by diffuse nodular regeneration surrounded by dense fibrotic septa with subsequent parenchymal extinction and collapse of liver structures, together causing pronounced distortion of hepatic vascular architecture. This distortion results in increased resistance to portal blood flow and hence in portal hypertension and in hepatic synthetic dysfunction. Clinically, cirrhosis has been regarded as an end-stage disease that invariably leads to death, unless liver transplantation is done, and the only preventive strategies have been screening for esophageal varices and hepatocellular carcinoma. Lately, this perception has been challenged, because 1-year mortality in cirrhosis varies widely, from 1% to 57%, depending on the occurrence of clinical decompensating events. Histopathologists have proposed that the histological term cirrhosis should be substituted by advanced liver disease, to underline the dynamic processes and variable prognosis of the disorder. Moreover, fibrosis, even in the cirrhotic range, regresses with specific therapy if available, such as antiviral treatment for chronic hepatitis B or C.The new concept in management of patients with cirrhosis is the use of non-specific therapies for prevention and early intervention to stabilise disease progression and to avoid or delay decompensation and the need for liver transplantation.

Epidemiology

Cirrhosis is an increasing cause of morbidity and mortality in more developed countries. The main causes in more developed countries are infection with hepatitis C virus, alcohol misuse, and, increasingly, non-alcoholic liver disease; infection with hepatitis B virus is the most common cause in sub saharan Africa and most parts of Asia. The prevalence of cirrhosis is difficult to assess and probably higher than reported, because the initial stages are asymptomatic so the disorder is undiagnosed.

Clinical Presentation

The clinical features of cirrhosis have been known since ancient times. The Ebers papyrus written around 2600 BC describes ascites, which was known to be associated with a “hardness of the liver” and excessive alcohol consumption. Signs and symptoms of decompensated cirrhosis include abdominal swelling, jaundice, and gastrointestinal bleeding. Sensitivity of these findings varies from 31 to 96 percent. Findings on physical examination include a contracted, nodular liver; splenomegaly; ascites; dilated abdominal wall veins; spider angioma; palmar erythema; peripheral edema; and asterixis. Patients may be diagnosed incidentally through laboratory findings. Elevated hepatic transaminase levels (e.g., alanine transaminase, aspartate transaminase) are suggestive of ongoing hepatocyte injury; however, these may be normal with advanced liver disease. Elevation of serum prothrombin time or International Normalized Ratio (INR) may indicate a decreased ability of the liver to synthesize clotting factors. Thrombocytopenia may indicate splenic sequestration. The total bilirubin level may also be elevated. Alcohol abuse and viral hepatitis are the most common causes of cirrhosis, although nonalcoholic fatty liver disease is emerging as an increasingly important cause. A more detailed list of underlying

etiologies is provided in Table 1. It is important to determine the cause of cirrhosis because management of the underlying disease (e.g., hepatitis B virus infection) may prevent additional liver injury.

Table 1. Common Etiologies of Cirrhosis

Inflammation	Genetic/congenital
Viral	Primary biliary cirrhosis
Hepatitis B (15 percent)	α_1-antitrypsin deficiency
Hepatitis C (47 percent)	Hemochromatosis
Schistosomiasis	Nonalcoholic fatty liver disease
Autoimmune (types 1, 2, 3)	Wilson disease
Sarcoidosis	Congestive heart failure (chronic passive congestion)
Toxic	Venoocclusive disease (Budd-Chiari syndrome)
Alcohol (18 percent)	Unknown (14 percent)
Methotrexate	

Pathophysiology

The transition from chronic liver disease to cirrhosis involves inflammation, activation of hepatic stellate cells with ensuing fibrogenesis, angiogenesis, and parenchymal extinction lesions caused by vascular occlusion. This process leads to pronounced hepatic microvascular changes, characterized by sinusoidal remodelling (extracellular matrix deposition from proliferating activated stellate cells resulting in capillarization of hepatic sinusoids), formation of intra hepatic shunts (due to angiogenesis and loss of parenchymal cells), and hepatic endothelial dysfunction. The endothelial dysfunction is characterized by insufficient release of vasodilators, of which the most important is nitric oxide. Release of nitric oxide is inhibited by low activity of endothelial nitric oxide synthetase (as a result of insufficient protein-kinase-B-dependent phosphorylation, lack of cofactors, increased scavenging

resulting from oxidative stress, and high concentrations of endogenous inhibitors of nitric oxide), with concomitant increased production of vasoconstrictors (mainly adrenergic stimulation and thromboxane A2, but also activation of the renin-angiotensin system, antidiuretic hormone, and endothelins).

Increased hepatic resistance to portal blood flow is the primary factor increasing portal pressure in cirrhosis (figure 1). It results from the combination of structural disturbances associated with advanced liver disease (accounting for about 70% of total hepatic vascular resistance) and of functional abnormalities leading to endothelial dysfunction and increased hepatic vascular tone; portal pressure could perhaps therefore be decreased by 30% if this functional abnormality were antagonized. The molecular mechanisms of these abnormalities are being delineated and represent new targets for therapy. Splanchnic vasodilation with an ensuing increase in the inflow of blood into the portal venous system contributes to aggravate the increase in portal pressure. Splanchnic vasodilation is an adaptive response to the changes in intrahepatic haemodynamics in cirrhosis; its mechanisms are directly opposite to those of the increased hepatic vascular tone. Because of this opposition, attempts to correct portal hypertension by acting on hepatic resistance or portal blood inflow should be ideally based on strategies acting as selectively as possible on the intrahepatic or the splanchnic circulation. In advanced cirrhosis, splanchnic vasodilation is so intense as to determine a hyper dynamic splanchnic and systemic circulation, which together with portal hypertension has a major role in the pathogenesis of ascites and hepatorenal syndrome. Systemic vasodilation further causes pulmonary ventilation/perfusion mis match that in severe cases leads to hepatopulmonary syndrome and arterial hypoxaemia.

Porto pulmonary hypertension is characterized by pulmonary vasoconstriction, which is thought to be due to endothelial dysfunction in the pulmonary circulation. Formation and increase in size of varices is driven by anatomical factors, increased portal pressure and collateral blood flow, and by angiogenesis dependent on vascular endothelial growth factor, all of which contribute to variceal bleeding. Dilation of gastric mucosal vessels leads to portal-hypertensive gastropathy. In addition, the shunting of portal blood to the systemic circulation through the portosystemic collaterals is a major determinant of hepatic encephalopathy, of decreased first-pass effect of orally administered drugs, and of decreased reticulo-endothelial system function. However, capillarisation of sinusoids and intrahepatic shunts are also important because these changes interfere with effective hepatocyte perfusion, which is a major determinant of liver failure.

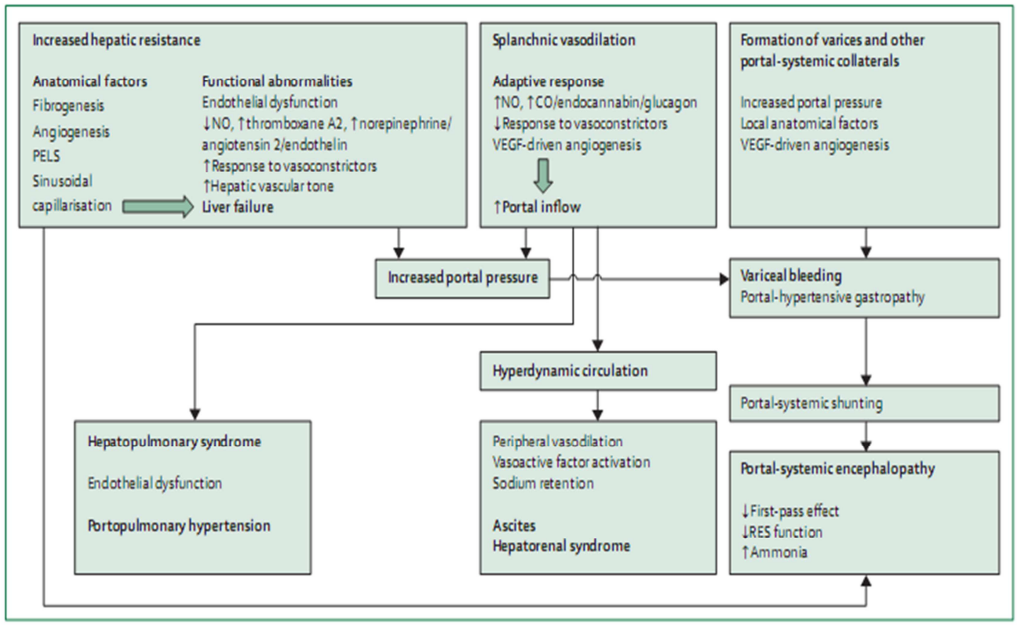


Figure 1: Pathophysiology of portal hypertension in cirrhosis (PELS=parenchymal extinction lesions. NO=nitric oxide. CO=carbon monoxide. VEGF=vascular endothelial growth factor. RES=reticuloendothelial system.)

Diagnosis

Most chronic liver disease is notoriously asymptomatic until cirrhosis with clinical decompensation occurs. Decompensating events include ascites, sepsis, variceal bleeding, encephalopathy, and non-obstructive jaundice. Imaging by ultrasonography, CT, or MRI of an irregular and nodular liver together with impaired liver synthetic function is sufficient for the diagnosis of cirrhosis. Other findings include small and shrunken liver, splenomegaly, and evidence of portosystemic collaterals. Differential diagnosis includes congenital hepatic fibrosis (fibrosis without regenerative nodules), nodular regenerative hyperplasia (nodules but no fibrosis), and non-cirrhotic portal hypertension. A liver biopsy is seldom needed but study of a sample can provide a definitive diagnosis and confirm the aetiology in cases of uncertainty. The transjugular approach yields samples of equal quality to the percutaneous one, is safe, and adds additional prognostic information through measurement of hepatic-vein pressure gradient (HVPG).

In early cirrhosis, however, conventional imaging can lead to false-negative diagnosis so other strategies are needed. Non-invasive markers of fibrosis are increasingly used; they are more informative at the extremes of the liver fibrosis range i.e, little or no fibrosis, and cirrhosis. They include indirect serum markers (simple, widely available indices), direct serum markers that measure biomarkers of fibrosis, and imaging modalities, such as transient elastography (table). These tests should be used and interpreted only once the aetiology is known.

Natural course

Cirrhosis should no longer be regarded as a terminal disease and the concept of a dynamic process is increasingly accepted. A prognostic clinical sub-classification with four distinct stages has been proposed with substantially differing likelihoods of mortality: stage 1 (compensated with no oesophageal varices) has an estimated mortality of 1% per year, and stages 2 (compensated with varices), 3 (decompensated with ascites), and 4 (decompensated with gastrointestinal bleeding) have annual mortality rates of 3·4%, 20%, and 57%, respectively.17 Infections and renal failure have been considered as stage 5, with 67% 1-year mortality. Acute decompensating events that lead to organ failure have mortality of 30%; notably, mortality is higher in previously compensated patients than in those with previous decompensation, which suggests greater tolerance of the latter through the effects of the inflammatory response. Decompensating events are generally triggered by precipitating factors that include infection, portal-vein thrombosis, surgery, and hepatocellular carcinoma

Further prognostication is important, especially for patients in the early asymptomatic phase. The traditional qualitative histological subclassification does not have a stage beyond cirrhosis so cannot be used to refine prognosis further. Semiquantitative histological subclassification based on nodular size and septal width is associated with both HVPG and clinical out-comes.Subclassification based on quantitative fi brosis assessment with collagen proportionate area in liver tissue is also associated with HVPG and clinical outcomes and is a promising approach (figure 2).

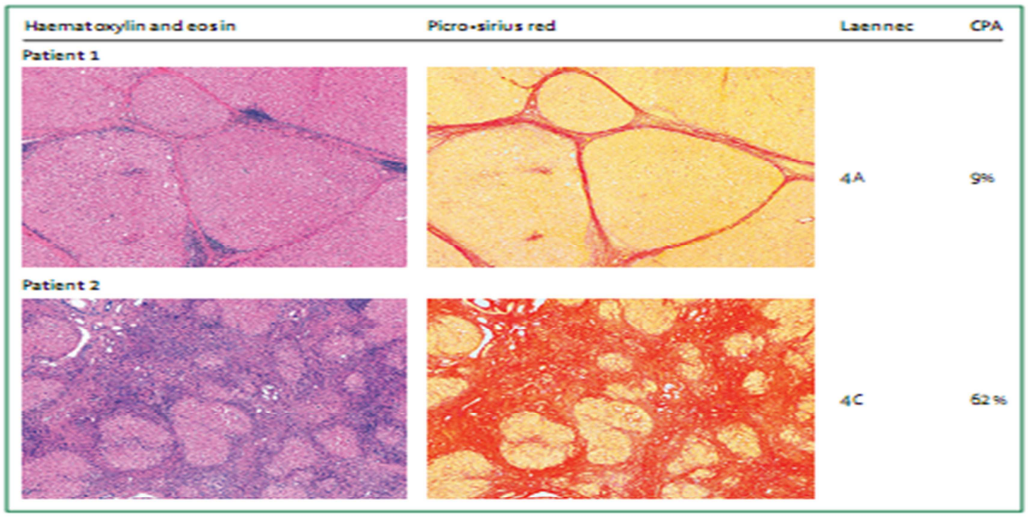


Figure 2: **Histological methods of subclassifying cirrhosis**
Laennec system (haematoxylin and eosin stain) and quantitative assessment of liver collagen with collagen proportionate area (CPA, picro-sirius red stain, collagen tissue stained red). Patient 1 is a 53-year-old man with chronic hepatitis C; the sample shows early cirrhosis. With haematoxylin and eosin stain, the cirrhotic nodules are large with thin internodular septum; the CPA is 9%. Patient 2 is a 53-year-old man with alcoholic liver disease; the sample shows advanced cirrhosis. Small cirrhotic nodules, thick internodular septum, and large quantity of fibrotic tissue with a CPA of 62% are seen. CPA=collagen proportionate area.

Non-invasive fibrosis markers, such as Fibroscan, Fibrotest, and ELF, are increasingly being used as prognostic markers. The predictive abilities of these methods should ideally be compared with those of semi quantitative or quantitative histological methods to subclassify cirrhosis. For patients with more advanced disease, prognostic scores are widely used to predict survival and the need for transplantation. The MELD score is based on creatinine and bilirubin concentrations and international normalised ratio (INR); it predicts 3-month mortality. UKELD adds serum sodium concentration to the MELD components and predicts 1-year mortality. The Child-Pugh score is based on bilirubin and albumin concentrations, INR, and the presence and severity of ascites and encephalopathy.by precipitating factors that include infection, portal-vein thrombosis, surgery, and hepatocellular carcinoma.

	Components	Aetiology of liver disease	Comments
Imaging modalities			
Ultrasonography	Liver nodularity/signs of portal hypertension	All	Low sensitivity in initial stages of cirrhosis
CT/MRI	Liver nodularity/signs of portal hypertension	All	Low sensitivity in initial stages of cirrhosis
Fibroscan	Measurement of liver stiffness	All	Exact cutoffs for specific fibrosis stages and causes not established
Acoustic radiation force impulse imaging	Measurement of liver stiffness	All	Validation is still underway
MR elastography	Measurement of liver stiffness	All	Not widely available; further validation needed
Indirect serum non-invasive fibrosis tests			
APRI	AST, platelets	HBV, HCV	
FIB4	Age, ALT, AST, platelets	HBV, HCV, NAFLD	
AST/ALT	ALT, AST	All	
Forns index	Age, γGT, cholesterol, platelets	HBV, HCV	
Proprietary serum non-invasive fibrosis tests			
Fibrotest	γGT, haptoglobin, bilirubin, A1 apolipoprotein, α2-macroglobulin	HBV, HCV, NAFLD, ALD	Biopredictive, France
ELF	PIIINP, hyaluronate, TIMP-1	HBV, HCV, NAFLD	Siemens, UK
Hepascore	Age, sex, α2-macroglobulin, hyaluronate, bilirubin, γGT	HCV, NAFLD	Pathwest, Australia
Fibrospect II	Hyaluronate, TIMP-1, α2-macroglobulin	HCV	Prometheus, USA
Fibrometer	Platelets, prothrombin time, macroglobulin, AST, hyaluronate, age, urea	HBV, HCV, NAFLD, ALD	BioLiveScale, France
Combination strategies			
Ultrasonography and Fibroscan	As above	All	Done simultaneously
Fibrotest and Fibroscan	As above	HCV	Done simultaneously; liver biopsy if tests discordant on fibrosis classification
Fibrometer and Fibroscan	As above	HCV	Done simultaneously; results are introduced in a computer algorithm to assess severe fibrosis
APRI and Fibrotest	As above	HCV	Done sequentially; Fibrotest if indeterminate values of APRI

Most commonly used non-invasive tests for diagnosis of cirrhosis1 (MR=magnetic resonance. APRI=AST-to-platelet ratio index. AST=aspartate aminotransferase. HBV=hepatitis B virus. HCV=hepatitis C virus. FIB4=fibrosis 4 index. ALT=alanine aminotransferase. NAFLD=non-alcoholic fatty liver disease. γGT= γ glutamyl transpeptidase. ALD=alcoholic liver disease. PIIINP=N-terminal peptide of type III procollagen. TIMP-1=metallopeptidase inhibitor 1.) Prevention and treatment of complications. The focus of this Seminar is on prevention and therapy in the initial stages of cirrhosis, including the first decompensating event.

Population screening

The increasing burden of liver disease and the problem of late presentation with decompensation emphasize the need for population screening to identify patients

with chronic liver disease, similar to screening for cardiovascular risk factors. In the USA, screening for chronic hepatitis C is cost effective for people born between 1945 and 1965. Non-invasive fibrosis markers could be screening tools in primary care, especially for non-alcoholic fatty liver disease and for alcohol misusers. The NAFLD fibrosis scores for non-alcoholic fatty liver disease is based on simple indices (age, platelet count, serum albumin, aminotransferases, and diabetes) and has a negative predictive value of 96% for advanced fi brosis. Similarly, more complex blood tests have been used to class patients in the community into three prognostic groups to rationalise secondary referrals. Transient elastography, now licensed in the USA, has also been used to classify patients, although specific test cut off s need to be established.41

Lifestyle changes and general measures.

Lifestyle changes tend to be overlooked in the management of cirrhosis, because life expectancy is judged to be short and the benefit is difficult to measure. Although evidence comes from cohort or case-control studies, lifestyle advice should still be offered to all patients, because it is easily implemented with little risk of side-effects or cost.

Insulin resistance, obesity, and the metabolic syndrome are pathophysiologically linked with non-alcoholic fatty liver disease, but they have deleterious effects irrespective of liver disease aetiology. Obesity is an independent predictor of cirrhosis in alcoholic liver disease, and the presence of metabolic syndrome is associated with more severe fibrosis and cirrhosis in chronic liver disease. In 161 patients with compensated cirrhosis who were followed up prospectively, obesity was independently associated with clinical de-compensation,

together with HVPG and serum albumin. Moreover, insulin resistance and metabolic syndrome were independently associated with liver-related mortality in a NHANES-III cohort of more than 2500 patients with chronic liver disease. Insulin resistance predicts the occurrence of hepatocellular carcinoma in cirrhosis, and in large cohorts, both diabetes and metabolic syndrome increased the risk of hepatocellular carcinoma. Overweight patients with compensated cirrhosis (clinical stages I and II) should therefore be advised to lose weight to lower their long-term risk of liver complications. In patients with decompensated cirrhosis, maintenance of adequate nutrition is important to avoid loss of muscle mass. Such patients have low tolerance to long-term fasting, with early onset of gluconeogenesis and subsequent muscle depletion, which can also contribute to development of hepatic encephalopathy. In a randomised controlled trial (RCT), a nutritional supplement given in the late evening over 12 months resulted in body protein accretion equivalent to 2 kg lean tissue; this approach should therefore be advised in such patients.

Alcohol intake is deleterious in patients with alcoholic cirrhosis but also in those with liver disease of other causes. In alcoholic cirrhosis, alcohol ingestion increases HVPG and portocollateral blood flow; these effects are likely also in cirrhosis of other causes thereby increasing the risk of variceal bleeding. Only abstinence from alcohol improves survival in alcoholic cirrhosis. In patients with chronic hepatitis C, alcohol intake increases the risk of cirrhosis and decompensated liver disease two to three times, even with moderate intake. Moreover, alcohol intake is an independent risk factor for hepatocellular carcinoma in chronic hepatitis C and non-alcoholic steatohepatitis. Therefore, all patients with cirrhosis irrespective of clinical stage should be advised to abstain from alcohol with relevant counselling if appropriate. Multidisciplinary alcohol care teams can lower the risk of acute hospital

admission and improve the quality of care. In many centres, abstinence irrespective of liver disease aetiology is mandatory for the patient to be considered for liver transplantation.

Vaccination against hepatitis A and B viruses, influenza virus, and pneumococcus should be offered as early as possible, because the antigenic response becomes weaker as cirrhosis progresses.

Cigarette smoking is associated with more severe fibrosis in chronic hepatitis C, non-alcoholic steatohepatitis, and primary biliary cirrhosis and possibly increases the risk of hepatocellular carcinoma in chronic hepatitis B. Cannabis use worsens fibrosis in chronic hepatitis C. Smoking cessation therefore should be advocated to prevent progression of liver disease and to facilitate eligibility for liver transplantation. Smoking also increases post-transplant morbidity and mortality. Antioxidant-rich foods and drinks have a potential preventive role in cirrhosis. Coffee consumption improves all-cause mortality but is also associated with a significant reduction in fibrosis in liver disease of various causes and with reduced risk of hepatocellular carcinoma as shown in a meta-analysis including 2260 patients with hepatocellular carcinoma For most of the benefits described, at least two cups of coffee daily are needed. In a phase 2 RCT, ingestion of dark chocolate blunted the postprandial HVPG increase in cirrhosis by improving flow mediated hepatic vasorelaxation and ameliorated systemic hypotension. The same effect on HVPG was noted with short-term administration of ascorbic acid

Physicians should always bear in mind drug interactions and the possible need for dose reductions when prescribing for patients with cirrhosis. Cause-specific treatments Patients with cirrhosis should be treated when possible for the underlying

liver disease to stop disease progression; such treatment includes immuno suppression for auto immune hepatitis, venesection for haemochromatosis, and copper chelators or zinc for Wilson's disease.

Patients with viral hepatitis should be assessed for antiviral treatment. All patients with cirrhosis who are positive for HBsAg should receive oral antiviral therapy with a potent antiviral (entecavir or tenofovir) irrespective of viral load. Oral antiviral therapy reduces HVPG and delays clinical progression to decompensation in responders. Treatment with tenofovir for 5 years resulted in regression of cirrhosis associated with hepatitis B virus in 71 (74%) of 96 treated patients. In patients with hepatitis-C-related cirrhosis without ascites, achievement of sustained virological response sign ifi cantly reduced liver-related morbidity and mortality. In a subgroup of patients, there was also regression of cirrhosis. This strategy is also valid for patients with hepatitis C listed for liver transplantation because of hepatocellular carcinoma rather than complications of portal hypertension, because achievement of sustained virological response reduces post-transplant recurrence of hepatitis C, which is otherwise universal. The newly licensed direct-acting antiviral drugs boceprevir and telaprevir increase rates of sustained virological response in patients with genotype. Supplementary strategies that can increase sustained response rates in this difficult to-treat group of patients, as shown in cohort studies, include weight loss in obese patients, vitamin D supplementation when concentrations are low, statins in patients with diabetes, and coffee drinking. Patients with cirrhosis who respond to antiviral treatment still need regular surveillance for hepatocellular carcinoma, because the risk, although reduced, is not eliminated.

Portal hypertension, varices, and variceal bleeding

Portal hypertension, rather than hepatocyte failure per se, is the underlying cause of most of the complications of cirrhosis and subsequent mortality. HVPG is a good surrogate marker of portal hypertension and has robust prognostic power. Portal hypertension is present when the HVPG is more than 5 mm Hg. However, clinically significant portal hypertension and the threshold for development of oesophageal varices is above 10 mm Hg. Patients with HVPG of less than 10 mm Hg had a 90% probability of not progressing to decompensation during median follow-up of 4 years, whereas for those with HVPG of more than 10 mm Hg the incidence of hepatocellular carcinoma was six times higher than in patients with lower HVPG. Formation of oesophageal varices is the first clinically relevant consequence of portal hypertension and represents clinical stage 2 of cirrhosis. Current recommendations are that all patients with cirrhosis should be screened for varices. The risk of development and growth of varices is 7% per year, and that of first variceal bleeding is 12% per year. Pre-primary, primary, and secondary prophylaxis strategies to prevent variceal bleeding are available. Treatment options include non-selective β blockers for varices, irrespective of size, or endoscopic band ligation for medium or large varices. A placebo-controlled RCT of timolol for preprimary prevention of varices formation did not show significant benefit. The study was powered to detect a 20% reduction in varices formation after median follow-up of 4 years, so smaller benefits cannot be excluded, especially since the formation of varices was significantly lower in patients achieving a reduction in HVPG than in those who did not.

Primary prophylaxis of variceal bleeding should be offered to all patients with varices, especially those that are large or have red signs. Non-selective β blockers and endoscopic band ligation are equally effective in prevention of bleeding and reduction of mortality, as shown in a meta-analysis that included only high-quality trials. Results from a large meta-analysis of non-selective β blockers versus placebo showed that the number of patients needed to treat with non-selective β blockers to prevent one death is Non-selective β blockers decrease cardiac output and cause splanchnic vasoconstriction thereby reducing portal inflow, as well as decreasing azygous vein blood flow and variceal pressure, which is more pronounced than the reduced portal inflow . They can also reduce total effective vascular compliance. Carvedilol is a β blocker with vasodilating properties resulting from α1-blockade; it decreases intrahepatic vascular resistance, which leads to a greater fall in HVPG than with conventional non-selective β blockers.88 In one RCT, carvedilol was more effective than endoscopic band ligation for primary prophylaxis of bleeding. A decrease in HVPG of at least 20% or to less than 12 mm Hg is associated with a significant reduction in variceal rebleeding compared with patients in whom these changes are not achieved, and defines patients receiving non-selective β blockers as responders.Measurement of acute haemodynamic response to propranolol could be a substitute for repeated HVPG measurements, because it predicts the risk of fi rst bleeding, with HVPG reduction cutoff s of 10% and 12% in prospective and retrospective studies, respectively. HVPG is not measured routinely, so non-selective β blockers are generally titrated to the maximum tolerated dose, aiming at a heart rate of below 60 bpm.69 Side-effects of fatigue, hypotension, and shortness of breath preclude their use in 15–20% of patients; however, specialised nurse-led clinics help to minimise withdrawal and enable successful dose titration. Carvedilol is titrated

against blood pressure and heart rate up to doses of 25 mg/day, because no greater reduction in HVPG is achieved with higher doses.

Endoscopic band ligation consists of placing rubber elastic bands on medium or large varices; it is repeated until the lesions are eradicated. We advocate use of nonselective β blockers as primary prophylaxis, because they are cheap and effective and obviate the need for the expertise that endoscopic band ligation requires. Moreover, non-selective β blockers also prevent bleeding from portal hypertensive gastropathy and have other benefi cial effects. Endoscopic band ligation has a small iatrogenic risk of death, owing to bleeding from post-banding ulcers. In one RCT,95 simvastatin lowered HVPG and improved liver haemodynamics in patients with cirrhosis and varices, and this effect was additive to that of nonselective β blockers. Since statins also significantly reduce the incidence of hepatocellular carcinoma among patients with diabetes and are not associated with an increased risk of hepatotoxicity in cirrhosis, these drugs could be given to patients with cirrhosis and hyperlipidaemia. Trials in non-hyperlipidaemic patients are in progress.

Patients with acute variceal bleeding need a combination of intravenous vasoactive drugs to reduce portal pressure (terlipressin, somatostatin, or octreotide for 2–5 days) and endoscopic therapy, preferably endoscopic band ligation, within 12 h of bleeding.98 They should also receive a 5-day course of antibiotics, because infection is pathophysiologically linked with variceal bleeding and antibiotics reduce early re-bleeding and mortality. In one RCT,101 a transfusion strategy aiming at haemoglobin concentrations of 70–90 g/L was associated with better survival in cirrhosis of Child class A or B than was a more liberal strategy. Transjugular intrahepatic porto systemic shunts are indicated for refractory bleeding despite endoscopic treatment. However,

one RCT 102 showed that in advanced cirrhosis with variceal bleeding (Child-Pugh C, or B patients with active bleeding at diagnostic endoscopy), early insertion of shunts within the first 72 h resulted in significantly lower risks of rebleeding and mortality. If those results are confirmed, access to emergency transjugular intrahepatic portosystemic shunting will need to be reorganised, because it is available only in specialised centres. Patients who have already experienced a variceal bleed need a combination of endoscopic band ligation and nonselective β blockers, because this strategy significantly reduces the risk of rebleeding, although it does not affect the risk of mortality compared with either treatment alone. (Figure 3)

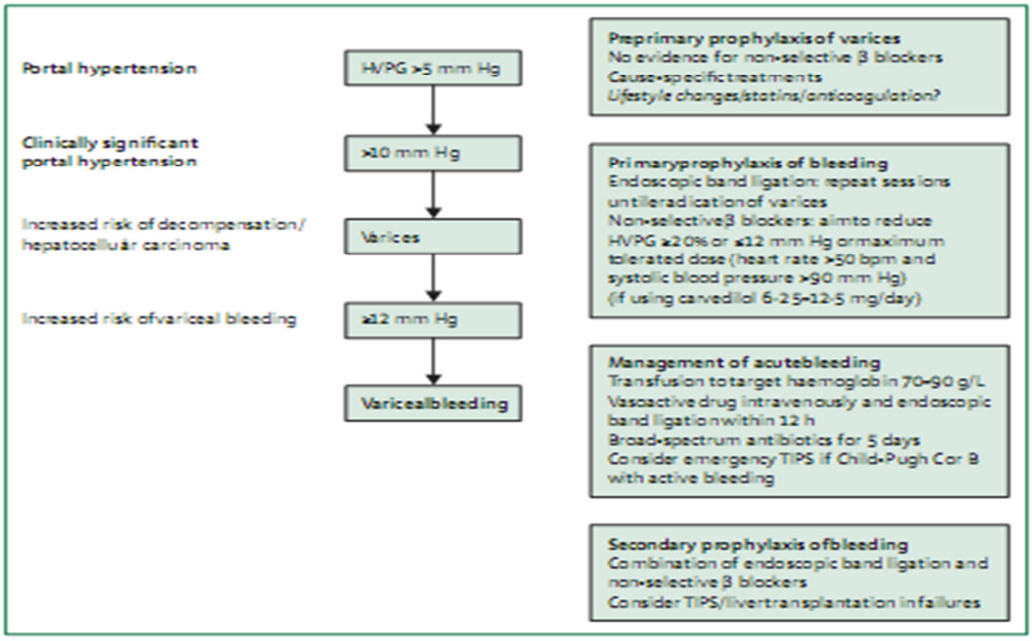


Figure 3: **Prevention and treatment of portal hypertension and varices at various degrees of severity**
HVPG=hepatic-vein pressure gradient. BPM=beats per minute. TIPS=transjugular intrahepatic portosystemic shunts.

Portopulmonary hypertension and hepatopulmonary syndrome are rare syndromes that are pathogenetically linked to the presence of portal hypertension: the former is characterised by abnormal pulmonary vasoconstriction and obliterative vascular remodelling and the latter by abnormal pulmonary vascular dilation.

Ascites

In cirrhosis, portal hypertension and splanchnic vasodilation, resulting mainly from increased production of nitric oxide, is the main pathophysiological mechanism of ascites (figure 4). The effective blood volume is initially maintained as a result of a compensatory increase in cardiac output. However, as cirrhosis progresses, this mechanism is not sufficient and homoeostatic activation of vasoconstrictor and antinatriuretic factors develops, with subsequent water and salt retention.105 Finally, the retained fluid accumulates in the peritoneal cavity as a result of increased portal pressure. The development of renal vasoconstriction leads to the hepatorenal syndrome. Type 1 hepatorenal syndrome is characterized by a doubling of serum creatinine concentrations within 2 weeks, whereas type 2 has a stable, less progressive course. The development of ascites is associated with a 1-year mortality rate of 20%. Renal failure is an index of end-stage liver disease and increases the risk of mortality by seven times, with 50% of patients dying within a month.Reduction of the HVPG should prevent formation of ascites. In 83 patients with large varices followed up for a mean of 53 months, propranolol prevented ascites if it lowered the HVPG by 10% or more. In patients with a new presentation of ascites, a diagnostic tap should be used to screen for underlying infection. When no underlying cirrhosis is evident, a gradient between serum and ascites fluid in albumin concentration of 11 g/L or more is very accurate for diagnosis of portal hypertension. Initial management consists of education of the patient about limiting dietary sodium to 80–120 mmoles daily (4·0–6·9 g/day) and oral diuretic treatment. Diuretic therapy should start with a morning dose of spironolactone 100 mg with or without furosemide 40 mg. An RCT showed that combined therapy is associated with better responses than sequential therapy. Current European guidelines advocate sequential treatment for first presentation of

ascites and combination therapy from presentation for recurrent ascites. Renal function and serum electrolyte concentrations should be monitored during diuretic treatment, particularly when doses are being gradually increased to achieve adequate weight loss, which should not exceed 1 kg per day in patients with peripheral oedema or 0·5 kg per day in those without. Maximum doses of 400 mg spironolactone and 160 mg furosemide are suggested, but few patients tolerate these doses without developing renal dysfunction. Random measurement of urinary sodium concentration is useful to monitor adherence to low-salt diet and response to diuretics. Ascites that does not respond to maximum tolerated diuretic doses is termed refractory. Midodrine together with standard medical treatment was superior to standard treatment alone in an RCT investigating recurrent or refractory ascites; it also improved systemic haemodynamics. Refractory or difficult to control ascites necessitates an assessment for liver transplantation. Such patients should be treated by large volume paracentesis with intravenous albumin administration (8 g/L) when the volume drained exceeds 5 L, to reduce the risk of postparacentesis circulatory syndrome. An alternative approach that significantly improves transplant free survival is a transjugular intrahepatic portosystemic shunt for patients with refractory ascites and preserved synthetic function. A combination of serum bilirubin concentration below 50 μmol/L and a platelet count above 75×10^9/L was predictive of survival in 105 patients with refractory ascites treated in this way. Non-steroidal antiinflammatory drugs should not be given to patients with ascites, because their renal function is highly dependent on renal prostaglandin synthesis and renal failure can be induced. Similarly, although inhibitors of angiotensin-converting enzyme reduce portal pressure and can potentiate or substitute for non-selective β blockers in patients with varices and no ascites, they should be stopped if ascites develops. Aminoglycosides are associated with a high

incidence of nephrotoxicity so other antibiotics should be used if possible. A single retrospective study reported reduced survival in patients with refractory ascites who received propranolol, attributed to paracentesis-induced circulatory dysfunction. However, the doses used were large and rarely administered in routine clinical practice, so decisions should be made on an individual basis with close monitoring.

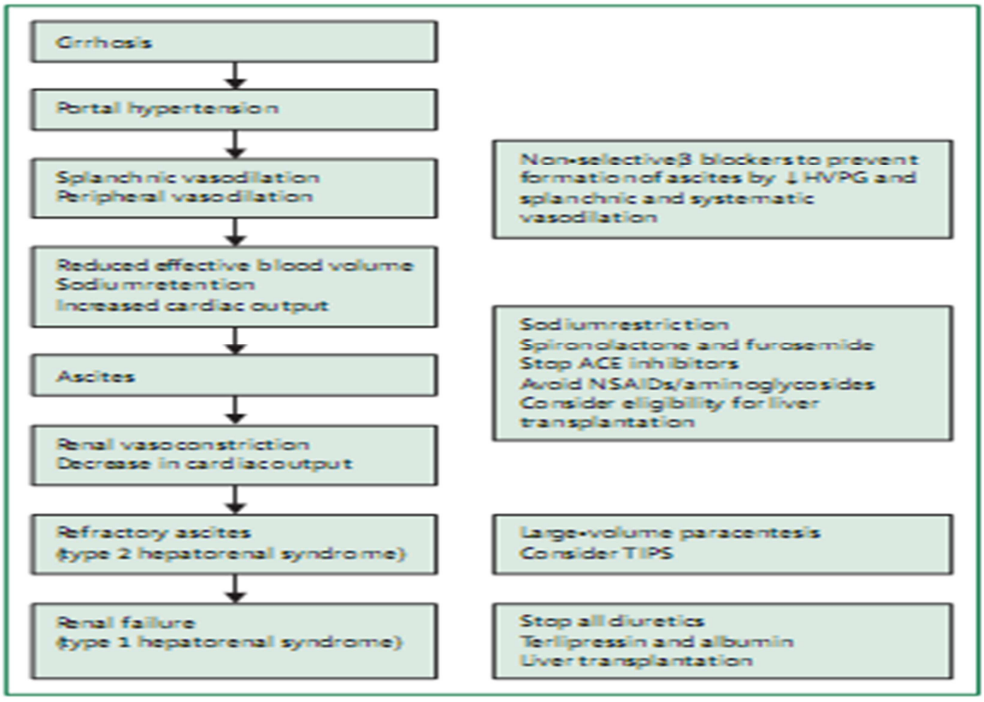


Figure 4: **Prevention and treatment of ascites at various degrees of severity**
HVPG=hepatic-vein pressure gradient. ACE=angiotensin-converting enzyme. NSAIDs=non-steroidal anti-inflammatory drugs. TIPS=transjugular intrahepatic portosystemic shunt.

Infection

Infection increases mortality in cirrhosis four times and has a poor prognosis, with 30% of patients dying within a month of infection and another 30% within a year. Most frequently diagnosed are spontaneous bacterial peritonitis, urinary-tract infections, pneumonia, and skin infections; the incidence increases with worsening liver function. Decreased bowel motility, bacterial overgrowth, and increased intestinal permeability all increase the risk of the translocation of intestinal microbiota

to the mesenteric lymph nodes, which predisposes patients to infection, most commonly spontaneous bacterial peritonitis, but is also the source of endotoxin and other bacterial products that influence systemic haemodynamics. Certain genetic polymorphisms also predispose to spontaneous bacterial peritonitis and indicate patients at increased risk. Bacterial DNA in non-infected patients with cirrhosis is associated with aggravation of peripheral vasodilation and worsening of intrahepatic endothelial dysfunction; it is also associated with poor prognosis. Defects in Kupffer cells and neutrophil function and an exaggerated proinflammatory response of mononuclear cells are commonly present and predispose to a poor outcome.

A meta-analysis showed that non-selective β blockers reduced the incidence of spontaneous bacterial peritonitis in patients with ascites, probably by increasing bowel motility and thus decreasing bacterial translocation. Intestinal permeability also improved and this effect is partly independent of the haemodynamic response. Indeed, in a rat model of cirrhosis, splanchnic sympathectomy reduced bacterial translocation. An RCT showed that selective intestinal decontamination with oral norfl oxacin for 2 weeks partly reverses the hyperdynamic circulation of cirrhosis, without influencing the hepatic and renal circulation.

Primary prophylaxis of spontaneous bacterial peritonitis with norfloxacin improves survival in patients with advanced cirrhosis or impaired renal function and low ascites protein concentrations (<15 g/L).130 Since the risk of infections with quinolone-resistant bacteria is high, we advocate primary prophylaxis only in patients listed for liver transplantation, because the period of administration is short and patients can be maintained in better condition. By contrast, secondary prevention with oral quinolones should be offered to all patients with a previous episode of

spontaneous bacterial peri-tonitis. No best strategy for prevention, if spontaneous bacterial peritonitis with quinolone-resistant organisms develops, has been established; available options include no prophylaxis or a rolling scheme of antibiotics. Spontaneous bacterial peritonitis is diagnosed if ascitic neutrophil count is more than 250 per μL and can be asymptomatic.109 Treatment consists of intravenous antibiotics and human albumin. The choice of antibiotics is influenced by previous quinolone prophylaxis, local prevalence of bacterial strains, and whether the infection was acquired in the community or in hospital. A 5-day course of intravenous cefotaxime is generally sufficient in most community-acquired cases. An RCT showed that intravenous albumin (1·5 g/kg on day 1 and 1·0 g/kg on day 3) lowers the risk of renal impairment and death from 30% to 10%.132 This eff ect is possibly limited if bilirubin concentration is more than 68·4 μmol/L or creatinine more than 88·4 μmol/L.133 In an RCT of 110 patients with infections that excluded spontaneous bacterial peritonitis, albumin also showed beneficial effects on renal and circulatory function, but not on survival. Proton-pump inhibitors should be used sparingly in cirrhosis with ascites, because the risk of spontaneous bacterial peritonitis is 4·3 times higher than without such treatment, and should be avoided in inpatients (except for those with peptic ulcer bleeding), because the risk of infection with Clostridium difficile is increased.

Encephalopathy

The development of encephalopathy is an ominous sign in cirrhosis, because the associated 1-year mortality rate is up to 64%. Patients who develop encephalopathy despite preserved liver function should be screened for the presence of spontaneous portosystemic shunts. Embolisation of large shunts is safe and

effective in selected patients. Overt encephalopathy is generally transient and linked with a precipitating event, such as use of sedatives, constipation, dehydration, infection, or gastrointestinal bleeding. Lactulose is the first-choice drug for prevention of recurrent encephalopathy; in an RCT, the risk of recurrent encephalopathy was 20% compared with 47% in placebo-treated patients. L-ornithine-l-aspartate is equivalent to lactulose as a first-line treatment. Rifaximin, a non-absorbable antibiotic, is effective when added to lactulose if encephalopathy recurs; it reduces the risk of further recurrence from 46% to 21%. Subclinical encephalopathy or minimal hepatic encephalopathy is more common than overt encephalopathy, and influences complex cognitive or coordination skills such as driving, leading to increased risks ofaccidents.

Hepatocellular carcinoma

Guidelines recommend 6-monthly ultrasonographic screening, because it results in more effective treatment of smaller hepatocellular carcinomas, although this approach has been inadequately assessed by RCT investigations.

Liver transplantation

Liver transplantation is a therapeutic option in patients who develop decompensation or hepatocellular carcinoma with cirrhosis.

Hepatic Encephalopathy

The most common complication of advanced liver disease is hepatic encephalopathy (HE) 141. HE is a particular kind of brain dysfunction which is typical of liver cirrhosis; it is characterized by nonspecific neurological and

psychiatric manifestations 142, ranging from subclinical psychometric alterations to delirium and coma 143. Covert HE includes minimal HE (MHE), characterized by abnormalities on neuropsychological, neurophysiological or psychometric tests (PHES, CFF, S-ANT1, CCHE), and a mild clinical form (HE grade I) in which abnormalities are usually recognized by caregivers and physicians. Overt HE (OHE) includes clinically detectable neurological and psychiatric disorders, such as asterixis, spatial and temporal disorientation, somnolence and, in the most severe form, delirium and coma (HE grade IV) . It has been proposed that HE be classified as follows based on the underlying disease:

- Type A: hepatic encephalopathy due to of acute liver failure
- Type B: hepatic encephalopathy due to portal-systemic bypass with no intrinsic hepatocellular disease
- Type C: hepatic encephalopathy due to cirrhosis with portal hypertension or systemic shunting 2. Type C HE is the most common form, and this review is focused on it. It is not easy to establish the incidence of HE in patients with liver disease due to the use of different clinical tools to diagnose HE and the fact that there are a lot of studies in which covert and overt HE are not well distinguished . The prevalence of covert HE ranges between 20% and 80% among cirrhotic patients . The prevalence of overt HE at the time of the first diagnosis of cirrhosis is between 10% and 20% . In decompensated cirrhosis, the prevalence of overt HE ranges between 16% and 21% . The overall incidence of overt HE after Transjugular Intrahepatic Portosystemic Shunt (TIPS) ranges between 25% and 45%, but if only new onset or worsening HE

are considered, a lower percentage of HE was found. HE is the complication of advanced liver disease that most frequently leads to hospitalization .

The pathogenesis of HE is not yet fully understood. High ammonia levels in the blood flow play a central role in the development of HE . Ammonia is predominantly produced in the gut as a product of protein digestion, amino acid deamination and bacterial urease activity. In addition, ammonia is produced and utilized in other organs, like muscles, kidneys and brain, in various biochemical reactions (i.e., the amidation of glutamate in muscles consumes ammonia) . In liver failure, the main pathway of ammonia metabolism is compromised, leading to hyperammonemia. Moreover, in patients with large portosystemic shunts, this mechanism is altered because blood flow from the gut, overloaded with ammonia, skips the liver, transporting higher levels of ammonia into the systemic circulation. High concentrations of ammonia can pass through blood–brain barrier, causing astrocyte swelling and cerebral edema. Even if it is known that ammonia is crucial in the development of HE, a direct correlation between levels of ammonia and the grade of HE has not been confirmed by studies. This suggests the existence of other pathogenetic mechanisms, such as systemic inflammation and intestinal barrier alterations.In the setting of intestinal barrier dysfunction and systemic inflammation, gut flora and its by-products such as ammonia, indoles, oxindoles and endotoxin play important roles in the pathogenesis of HE. It has been demonstrated that gut microbiota differ between cirrhotic patients and healthy controls. The fecal microbiota of patients with cirrhosis is characterized by a higher prevalence of Alcaligeneceae, Porphyromonadaceae and Enterobacteriaceae, species that are strongly associated with cognition and inflammation in HE. This study indicates that future trials with

targeted prebiotics and probiotics and/or fecal transplantation should aim at enhancing cognition through the modulation of these microbiome components.

The diagnosis of HE is based on clinical features (asterixis, temporal and spatial disorientation, somnolence, changes of personality, stupor and finally, coma) and on the exclusion of other neurological disorders that may imitate HE, such as dementia, meningoencephalitis, hypercapnia, electrolyte alterations, psychosis, drug or alcohol intoxication, Wilson disease and brain masses. Once the diagnosis is made, every effort should be made to identify single or multiple precipitants and implement appropriate corrective measures .

"Classical" Precipitants and Their Management

Infections

Infections are one of the most frequent causes of worsening liver function in patients with acute or chronic liver disease, increasing mortality, morbidity and the prevalence of other complications. Bacterial infections are a major cause of gastrointestinal bleeding, kidney failure, acute-on-chronic-liver failure (ACLF) and hepatic encephalopathy (HE) in patients with liver disease. Patients with cirrhosis are more likely to develop infections because of multiple factors, i.e., a certain grade of immuno-dysfunction, increased translocation of intestinal bacteria into the bloodstream and the alteration of gut microbiota in terms of a reduction of beneficial phyla and an overgrowth of pathogenic phyla. The prevalence of bacterial infections in patients hospitalized for decompensated cirrhosis is around 25–46%. Patients with higher Child-Pugh and MELD scores and with ascites or gastrointestinal bleeding are more susceptible to infections. Spontaneous bacterial peritonitis (SBP) represents the

most common infection in these patients, followed by urinary tract infections, pneumonia, bloodstream infections and skin and soft tissue infections. Historically, gram negative bacteria (notably *Enterobacteriaceae*) are most commonly responsible for SBP and urinary tract infections, while gram positive are a major cause of pneumonia. Nowadays, the epidemiology of infections in cirrhotic patients has changed due to the use of quinolones for the prophylaxis of bacterial infections. This has led to a higher number of gram positive infections, a larger use of third generation cephalosporins, which has increased bacterial resistance, and an increase of the prevalence of multidrug-resistant and extensively drug resistant bacterial infections. Bacterial resistance leads to a higher number of cases of health-care associated (HCA) and hospital-acquired (HA) infections. Merli et al. demonstrated that HCA and HA are the most frequent infections in hospitalized cirrhotic patients, and that infections are related to increased cognitive impairment in patients with cirrhosis compared to those without liver disease. Bacterial products cause an excessive pro-inflammatory response and the production of pro-inflammatory molecules, leading to immunopathological tissue damage. Additionally, cell necrosis induced by infections leads to the release into the bloodstream of danger-associated molecular patterns (DAMPs) that stimulate innate immune system and pro-inflammatory responses. Regarding brain damage, the immunological response to infections may result in cerebral edema in patients with cirrhosis, which is a substrate of the development of HE. Alabsawy et al. wanted to determine if overt HE predisposes patients to the onset of infections; they demonstrated that overt HE is an independent risk factor for new infections in cirrhotic patients with acute decompensation. These findings suggest the presence of a mutual relationship between HE and infections, in which one

predisposes patients to the other. This finding should stimulate new research to identify pathophysiological and possible target therapies.

As shown in Table 1, every patient admitted to hospital with signs of cirrhosis decompensation should be tested for potential infections. A chest X-ray should be performed in order to exclude the presence of compatible parenchymal infiltrates suggestive of pneumonia. Additionally, urine analysis and, when necessary, urinecolture should be executed to identify urinary tract infections. SBP should be investigated in patients with ascites. A diagnostic paracentesis is mandatory upon admission in hospital; a diagnosis of SBP is made if the polymorphonuclear cell (PMN, also referred to as neutrophils) count in the ascitic fluid is $\geq$250 cells/mm^3, the culture results are positive and secondary causes of peritonitis have been excluded. If systemic infection is suspected, blood cultures should be performed. As suggested by the EASL guidelines, empirical antibiotic therapy has to be started promptly if an infection is suspected, and the choice of antibiotics should be guided by the environment (community vs. nosocomial vs. health-care associated infection), local antibiotic resistances and the severity and type of infection.

Table 1 Checklist for the identification and treatment of precipitating factors for hepatic encephalopathy.

Precipitants	Diagnosis	Management
Infections	• Pneumonia: ask for recent history of fever or cough, leucocyte count and CRP, chest X-ray or HRCT scan • Urinary tract infections: ask for recent history of urinary symptoms, leucocyte count and CRP, urine test and urinoculture. • SBP: diagnostic paracentesis • Sepsis: ask for recent history of fever, leucocyte count, CRP and procalcitonin, blood culture • Acute gastroenteritis: diarrhea with or without fever and presence of pathogens in stool • Others: presence of pathogens	Start empirical antibiotic therapy promptly is infection is suspected, (the choice of antibiotics should be guided by the environment, local antibiotic resistances and the severity and type of infection). Once the antibiogram is available, start specific antibiotic therapy.
Gastrointestinal Bleeding	Any evidence of upper GI tract bleeding (hematemesis, melena)	• Variceal Bleeding: stabilize the patient if unstable, start vasoactive drugs and antibiotic prophylaxis and perform upper endoscopy within 12 h: • EV: endoscopic band ligation • GOV2 and IGV1-2: adhesive tissues • GOV1: endoscopic band

Precipitants	Diagnosis	Management
		ligation or adhesive tissues. • Consider TIPS placement in selected cases.Non-Variceal Bleeding: stabilize the patient if unstable + start PPI iv at high dosage + perform upper endoscopy within 24 h (<12 h if high risk patient) + endoscopic hemostasys if indicated.
Dehydration	Any sign of dehydration (skin and mucosal dryness, confused state) in a suitable context (patient with vomiting, diarrhea, diuretics abuse), as well as sodium, creatinine and hematocrit increase	Correct dehydration (fluid therapy, stop diuretics)
Electrolyte Disorders	Hyponatremia (sodium < 130 mEq/L);	• hypovolemic hyponatremia: administration of normal saline; • hypervolemic hyponatremia: fluid restriction (<1000 mL/day), consider hypertonic saline or albumine administration.
	Hypokaliemia (potassium < 3 mEq/L)	Administeroral or iv KCl
Constipation	More than 24 h without passing stool or demonstration of significant fecal retention in colon	Oral laxatives and/or cathartics, bowel enemas
Malnutrition	• Non-instrumental tools: BMI, food diary, objective	Dietary advice for a correct supply of nutrients

Precipitants	**Diagnosis**	**Management**
	examination, biochemical parameters, anthropometric measurements, creatinine-to-weight ratio, subjective global assessment questionnaire	
	• Instrumental tools: bioimpedance test, handgrip strength test, DEXA, computed tomography scan	Physical exercise to improve muscle trophism based on the patient's potential
Portosystemic shunts		
• Spontaneous	Evidence of SPSS at radiologic imaging (eco, CT scan or MRI)	Radiological shunt obliteration (BRTO, CARTO, PARTO) in case of recurrent/persistent HE
• TIPS	Anamnesis and/or evidence of TIPS at radiologic imaging	TIPS revision if necessary
Alcohol and Drugs	Anamnesis	Stop alcohol consumption and hepatotoxic drugs

The implementation of preventive measures for infections is crucial in these patients. To this end, the use of vaccinations should be encouraged (not only the mandatory ones, but also recommended vaccinations, according to the guidelines in different countries), and good general hygiene and dental status are strongly recommended.

Gastrointestinal Bleeding

Gastrointestinal bleeding (variceal or non-variceal bleeding) is one of the most common precipitants of HE. Nowadays, the relationship between gastrointestinal bleeding and HE is well-known. Gastrointestinal bleeding leads to an increase in blood ammonia 148; the incidence of HE after a GI bleeding ranges from 10 to 39% in high-risk patients (Child Pugh C or B with active bleeding). Rattanasupar et al. tried to define clinical predictors of HE in cirrhotic patients presenting with acute variceal bleeding 174; according to their retrospective study, Child-Pugh score C, serum levels of potassium < 3 mEq/L, white blood cells count > 10,000/mm^3 and Hb < 8 g/dL were considered significant predictors of the development of HE. Moreover, cirrhotic patients who develop HE have higher morbidity and mortality rates. According to the latest RCTs, there are only sparse and conflicting data about prophylaxis of HE in patients with acute gastrointestinal bleeding. Two recent single-center randomized studies demonstrated that the use of lactulose in cirrhotic patients admitted to hospital with acute variceal and non-variceal gastrointestinal bleeding is effective in preventing HE compared to a placebo. Another recent RCT suggested that primary prophylaxis with anti-ammonium drugs (lactulose, L-ornithine L-aspartate or rifaximin) proved to be effective in preventing HE in patients with variceal bleeding compared to a placebo. In contrast, in a more recent randomized trial, Rattanasapur et al. showed that the use of primary prophylaxis with lactulose in cirrhotic patients with acute upper gastrointestinal bleeding was ineffective compared to placebo to prevent HE, and unnecessary treatment with laxatives should be avoided. These conflicting data should stimulate new studies on the effectiveness of primary prophylaxis in these patients. According to the latest EASL guidelines, in cirrhotic patients with GI bleeding, rapid removal of blood from the gastrointestinal tract (with mannitol or

lactulose by nasogastric tube or lactulose enema) is an effective treatment to prevent HE.

According to the latest Baveno VII guidelines, in patients presenting with suspected acute variceal bleeding, vasoactive drugs and antibiotic prophylaxis should be started as soon as possible, and upper endoscopy should be performed within 12 h of presentation. Once it has been determined if bleeding is occurring in the esophageal or gastric varices, endoscopic therapy should be performed. In case of esophageal variceal bleeding, endoscopic band ligation is recommended; tissue adhesives (N-butyl-cyanoacrylate/thrombin) are recommended in gastro-esophageal varices type 2 and in isolated gastric varices. Both endoscopic therapies can be used in gastro-esophageal varices type 1. Additionally, TIPS is indicated in selected cases. To prevent recurrent variceal hemorrhage, the first-line prophylactic therapy is the combination of traditional non-selective beta-blockers (NSBBs) or carvedilol and endoscopic ligation. TIPS can also be used in secondary prophylaxis of variceal bleeding in patients who rebleed despite traditional NSBBs or carvedilol and endoscopic ligation. In acute variceal bleeding which is refractory to traditional pharmacological and endoscopic therapies, balloon tamponade or self-expandable metal stents should be used as a bridge therapy before a more definite treatment, such as TIPS is implemented (Table 1).

To prevent the first episode of GI bleeding, treatment with NSBBs should be considered in patients with clinically significant portal hypertension (high-risk varices). There is no evidence that endoscopic therapies might prevent ascites or HE, but in patients who have contraindications or intolerance to NSBBs, endoscopic band ligation is recommended as a primary prophylaxis.

Dehydration

Dehydration is another precipitant of HE in patients with advanced liver disease. There are multiple causes of dehydration in patients with cirrhosis, such as the overuse of diuretics, large volume paracentesis and lactulose-related diarrhea in patients treated for prophylaxis for HE. Dehydration can also be caused by comorbidities that patients may have, like diabetes mellitus; therefore, dehydration is often a multifactorial condition. Pantham et al. demonstrated that dehydration is the most recognized precipitant for overt HE in patients with cirrhosis. In particular, a comparative study by Bajaj et al. showed that lactulose-associated dehydration was associated with recurrent HE episodes. In dehydrated patients, it is important to remove the cause of dehydration where possible (stop diuretics when necessary), give supportive therapies to restore idro-electrolytic values and, when necessary, properly titrate lactulose in order to maintain its safety profile (Table 1).

Electrolytes Alterations

Hyponatremia is one of the most common electrolyte alterations observed in cirrhotic patients 185. Sodium serum levels < 135 mmol/L are associated with high rates of complications in liver cirrhosis, such as ascites, renal failure, sepsis, HE and mortality. Hyponatremia in cirrhotic patients is due to a combination of pathophysiological mechanisms, including splanchnic vasodilatation and increased secretion of antidiuretic-hormone (ADH). Cirrhotic patients have a pathological reduction of brain organic osmolytes (which are responsible for the compensatory osmoregulatory mechanism against brain cells swelling during hyponatremia). Therefore, in case of hyponatremia, this brain compensatory osmoregulatory mechanism is enhanced; this may be relevant to the pathogenesis of HE and

neurological symptoms in cirrhotic patients with hyponatremia. Guevara et al. discovered that low levels of serum sodium are a major risk factor of development of overt HE in cirrhotic patients and, in particular, in patients with refractory ascites. The debate about whether hyponatremia causes a form of brain disturbance that is separate from HE or causes HE directly is still open. Watson et al. suggested that there is an interdependence of liver failure and hyponatremia, and that the improvement of hyponatremia in patients with cirrhosis leads to an increase in the speed of complex information processing analyzed with the trail-making test (TMT). Bossen et al. demonstrated an association between serum sodium and HE incidence; the hazard rate of HE development increase by 8% for every mmol/L decrease in serum sodium. Additionally, hypokalemia (potassium < 3 mEq/L) is a precipitant of HE, but a less relevant one than hyponatremia ,In cases of hypovolemic hyponatremia, the administration of normal saline is sufficient, while in cases of hypervolemic hyponatremia, fluid restriction (<1000 mL/day) or hypertonic saline or albumine administration is suggested.

Constipation

Another important precipitant of the development of HE is constipation. Constipation leads to an increased orocecal transit time, a higher reabsorption of toxic metabolites from the gut and a higher level of blood ammonia. A longer orocecal transit time is associated with an increased risk of developing HE. The role of constipation in the origin of hepatic encephalopathy is still controversial, both because it is a parameter that can hardly be objectified and because it often coexists with other precipitants (e.g., infections, dehydration), making it difficult to identify the real cause of HE. Management of constipation consists of using osmotic oral laxatives and/or

cathartics and bowel enemas (Table 1). In particular, lactulose and lactitol are the first line therapy, both because they reduce the absorption of ammonium from the colon, reducing its circulating levels, and because they have a cathartic action, clearing the gut of ammonia before it can be absorbed, thereby contributing to the improvement of HE. Lactitol seems to be more tolerable and produces fewer side effects than to lactulose. The goal of therapy is to ensure two or three bowel movements a day in the absence of diarrhea or dehydration .

Others

The consumption of alcohol in patients with advanced liver disease is also a major risk factor for the development of HE, so any patient with a diagnosis of cirrhosis must stop alcohol consumption.

Limited evidence is available to support the hypothesis that benzodiazepines (BDZ) increase the risk of HE in patients with cirrhosis. A study by Grønbæk L et al. demonstrated that cirrhotic patients who had begun using BDZ had a markedly increased risk of developing first-time HE in the 3rd to the 10th day after starting BZD therapy, while in the 1st and 2nd and after 28 days, there was no such an excess risk.

New Precipitants and Their Managemen

Muscle Alterations

Muscle alterations are frequent in patients with liver cirrhosis and include the loss of muscle mass (sarcopenia) and the infiltration of muscle mass by intermuscular and intramuscular fat (myosteatosis). Both conditions are frequent in patients with

chronic liver disease; in fact, sarcopenia is observed in up to 70% of cirrhotic patients, and it is associated to a higher mortality in these patients. A recent study showed that the accuracy of the MELD score in predicting mortality at 3 and 6 months could be ameliorated by considering muscle alterations 200. In cirrhotic patients, muscle alterations can occur for multiple reasons, i.e., inadequate dietary intake, impaired absorption and substrate utilization due to liver disease. In normal conditions, the liver is involved in ammonia detoxification among its various other functions; this mechanism is altered in patients with cirrhosis and/or in the presence of porto-systemic shunts. Skeletal muscle has a compensatory function in ammonia metabolism and clearance, so a reduction in the quantity of muscle mass leads to an increase of blood ammonia levels, enhancing the risk of HE episodes in cirrhotic patients. It has been demonstrated that muscle alterations are strong risk factors for the development of both minimal and overt HE. According to the results of Nardelli et al. 61, myosteatosis was detected in 68% and sarcopenia in 84% of patients with overt HE. Moreover, both myosteatosis (62.5% versus 12.5%, $p < 0.001$) and sarcopenia (84% versus 31%, $p < 0.001$) were more frequent in patients with MHE than in those without. In that study, it was demonstrated that survival was significantly lower in malnourished patients. The relationship between HE and sarcopenia is now well-established; the co-presence of sarcopenia and a previous history of HE is associated with higher mortality. Since malnutrition worsens the prognosis, in addition to the treatment of the underlying causes of cirrhosis and its complications when they occur, an early assessment of nutritional status should be performed in these patients. Nowadays, both instrumental and non-instrumental tools are available to asses nutritional status in cirrhotic patients, such as the bioimpedance test, handgrip strength, DEXA and computed tomography scans for the first category, and food

diaries, objective examinations, biochemical parameters (level of total plasma protein), anthropometric measurements, the creatine-to-weight ratio and subjective global assessment questionnaires in the latter category. As well as nutritional assessments, dietary control is a valid tool to improve nutritional status and prognosis. According to recent guidelines, diet in cirrhotic patients with and without HE should not differ; a daily caloric intake in non-obese cirrhotic patient of 30–40 kcal/Kg/day with a protein intake of 1–1.5 g/Kg/day and a diet that is rich in vegetable and dairy proteins are recommended. Electrolyte and vitamin monitoring should be done, and these must be supplemented in case of deficiency. Dietary protein restriction in patients with HE is no longer recommended. Physical exercise, as long it increases muscle mass, may reduce the risk of HE episodes.

Spontaneous Portosystemic Shunts (SPSS)

In patients with advanced liver disease, the increase of portal hypertension can lead to the opening of communications between portal veins and systemic circulation. These communications are called spontaneous portosystemic shunts (SPSS). Patients with cirrhosis frequently develop SPSS as a complication of long-term portal hypertension. SPSS can be divided into “left-sided” if they are located to the left of the spleno-porto-mesenteric confluence and “right-sided” if they are located to the right. Splenorenal shunts (“left-sided”) are most associated with the development of recurrent or persistent HE. Blood flow diversion directly into the systemic circulation, due to the presence of these shunts, causes an increase in the ammonia levels in the circulation, increasing the risk of HE. A retrospective multicenter study by Simon-Taléro et al. showed that the prevalence and size of shunts increase with deterioration of liver function, and the risk of HE and portal hypertension complications is

associated with the presence of SPSS. Furthermore, Riggio et al. demonstrated a higher prevalence of SPSS in cirrhotic patients with chronic HE compared to those without. A recent multicenter study investigated the variables independently associated with the presence of SPSS (as detected by CT scan) and found that portal vein thrombosis and cirrhosis Child-Pugh C were independently associated with SPSS of any size, while previous HE and portal vein thrombosis were the only variables associated with the presence of large size SPSS (>1 cm). Patients with advanced chronic liver disease are more likely to have more than 1 SPSS. A multicenter study by Praktiknjo et al. demonstrated that the total cross-sectional SPSS area (TSA) (rather than diameter of the single largest SPSS) predicts survival. It has been suggested that a TSA > 83 mm^2 increases the risk of OHE.

In case of refractory or persistent HE due to the presence of SPSS, the elective treatment is shunt obliteration. Several studies have demonstrated the efficacy and safety of this treatment, revealing improved survival, a reduction of HE episodes, amelioration of symptoms and a reduction of the number of hospitalizations. The two main indications of shunt embolization are bleeding from gastric varices and treatment of persistent/refractory HE. The oldest therapeutic technique is balloon-occluded retrograde transvenous obliteration (BRTO), in which a balloon catheter is placed retrogradely into the shunt to stop the communication between portal and systemic circulation; then, a sclerosant is injected into the shunt and into the varices for thrombus formation. The newest techniques are plug-assisted retrograde transvenous obliteration (PARTO) and coil-assisted retrograde transvenous obliteration (CARTO). In PARTO, a vascular plug is used instead of a balloon catheter; large size coils are used in CARTO.

Transjugular Intrahepatic Portosystemic Shunt (TIPS)

A transjugular intrahepatic portosystemic shunt (TIPS) is an interventional radiological procedure that consists of the creation of an artificial channel of communication between the portal vein and the hepatic veins via the insertion of an intrahepatic stent. TIPS is used to treat complications associated with portal hypertension, such as variceal bleeding and refractory ascites. One of the major complications of TIPS is post-TIPS HE. The incidence of new or worsening HE after TIPS placement is 35–50% and the risk of refractory HE after TIPS is 8%. Nowadays, there is little evidence for the existence of an effective pharmacological treatment to prevent the onset of post-TIPS HE. Riggio et al. demonstrated that there was no difference in HE incidence in the first month after TIPS in three groups of patients (a placebo group, a lactitol group and a rifaximin group), although that study had a small sample size and a short duration of follow-up after TIPS. A more recent RCT by Bureau et al. compared rifaximin to placebo for the prevention of post-TIPS HE. According to the results, the cumulative incidence of HE in all the enrolled patients was lower in the rifaximin group compared to the placebo group. Otherwise, if only patients without history of HE were considered, the trend remained positive for the rifaximin group, although statistical significance among the two groups was not achieved. According to the latest EASL guidelines, in patients with cirrhosis and history of overt HE, rifaximin can be considered for post-TIPS HE prophylaxis in cases of non-urgent TIPS placement, but further studies are needed to support the efficacy of this. . There is also a correlation between incidence of post-TIPS HE and stent diameter. A lower portosystemic pressure gradient is associated with a higher risk of HE. A recent RCT compared 8 mm stents vs. 10 mm stents in patients who underwent TIPS placement to prevent variceal re-bleeding; it emerged that while 10

mm and 8 mm showed similar shunt function, the risk of HE was halved with 8 mm stents. Therefore, the latter should be used for the prevention of variceal bleeding in patients with advanced liver disease. The introduction of new stents with controlled expansion may allow the operator to control the portosystemic pressure gradient, thereby reducing the risk of post-TIPS HE. The use of under-dilated TIPS (stent caliber < 8 mm) seemed to be feasible and was associated with lower rates of HE, with no increase in recurrent variceal hemorrhage and ascites, compared to normal caliber TIPS. Numerous studies have shown that TIPS is associated with improvement in sarcopenia, so the risk of post-TIPS HE might gradually decrease with skeletal muscle growth after TIPS placement. In addition, TIPS plays an important role in controlling symptoms such as gastrointestinal bleeding or SBP, which are precipitants of HE. Therefore, the high risk of HE might exist only in the short-term post-TIPS period, while the long-term risk of HE in patients treated with TIPS might not be higher than that in patients treated with other methods. Further studies are needed to investigate these differences. Nevertheless, given the high incidence of post-TIPS HE and the lack of effective and standardized treatments to prevent HE, the selection of patients to undergo TIPS implantation remains crucial, and risk factors (older age, previous HE episodes, impaired liver function, impaired renal function, malnutrition) should be considered.

Overview of Available Pharmacological Treatments for HE

The management of overt HE is based on the identification of HE precipitants and their correction and on empirical treatment aimed at reducing blood levels of ammonia . In the previous sections, precipitants and their management were discussed. To date, the most common drugs used for HE treatment are non-absorbable

disaccharides (lactulose or lactitol) and non-absorbable antibiotics (rifaximin). After the first episode of HE, secondary prophylaxis should be started with non-absorbable disaccharides at a dosage of 20 mL of syrup or the equivalent in granules twice daily. The dosage can be modulated in order to obtain 2–3 soft tools per day. Rifaximin should be added if HE recurs (one or more HE episodes within 6 months).

In the following section, we provide is an overview of treatments that may benefit patients with HE:

Probiotics: probiotics are live micro-organisms that are capable of modulating the host gut microbiome, decreasing the burden of pathogenic intestinal bacteria and ameliorating the toxic effects of bacterial translocation in cirrhosis. There is a lack of strong evidence supporting the use of probiotics in patients with HE. A Cochrane review published in 2017 included 21 trials and more of 1400 patients comparing patients with HE and cirrhosis treated with probiotics vs. those treated with placebo, no intervention or any other treatment for HE. According to that review, probiotics improved the development of overt hepatic encephalopathy, quality of life and plasma ammonia concentrations. It should be emphasized that most trials suffered from a high risk of systematic and random errors, making the quality of the available evidence very low. A more recent meta-analysis demonstrated that probiotics could decrease serum ammonia and endotoxin levels, improve MHE and prevent overt HE development in patients with liver cirrhosis. However, due to the fact that the data on the effects of probiotics in HE are not consistent, currently, there are several ongoing studies seeking to clarify the role of probiotics on gut microbiota modulation in these patients.

Fecal microbiota transplantation (FMT): FMT is currently mainly used for recurrent infection of C. Difficile. There is one case report and two small RCTs that demonstrate the efficacy of FMT in cirrhotic patients with HE in terms of reducing cognitive impairment and number of hospitalizations The rationale behind the use of FMT in cirrhotic patients with HE is to modulate gut microbiota composition, thereby reducing the gut dysbiosis which is typical of cirrhotic patients.243. A recent review of eight studies showed long-term improvement in cognitive performance in cirrhotic patients who underwent FMT. However, the clinical applicability of FMT for treating HE remains under investigation.

L-ornithine l-aspartate (LOLA): L-ornithine and L-aspartate are amino-acids involved in metabolic pathways that lead to the production of urea and glutamine, incorporating ammonia molecules. In this way, LOLA lowers blood ammonia. A recent review with a meta-analysis showed that treatment with LOLA is effective as a secondary prophylaxis of overt HE and as a primary prophylaxis of HE following acute variceal bleeding compared to placebo or no treatment. A RCT comparing LOLA, lactulose and probiotics showed similar efficacy. A recent Cochrane review confirmed the efficacy of LOLA on mortality and amelioration of HE compared to placebo or no intervention. However, because of the low quality of evidence, these findings are subject to scrutiny. The evidence of a possible beneficial effect of L-ornithine L-aspartate on hepatic encephalopathy, when compared with probiotics, was also of very low quality, and no other benefits were demonstrated in comparison with other active agents. A recent double-blind RCT by Arpan J et al. evaluated the role of intravenous LOLA in patients with cirrhosis with high grade HE (OHE grade III-IV). It was demonstrated that a combination of LOLA with lactulose and rifaximin was

more effective than only lactulose and rifaximin in improving the grade of HE and recovery time from encephalopathy. However, more data are needed to establish the role of LOLA in HE treatment.

Polyethylene glycol (PEG): PEG administrated by nasogastric tube alone or in association with lactulose has been associated with a more rapid resolution of overt HE requiring hospitalization. Compared to lactulose, PEG can lead to a more rapid resolution of HE during the first 24 h and shorten the length of hospital stay without increasing the rate of adverse effects.

Other antibiotics: neomycin, metronidazole and vancomycin have been used but are currently not recommended because of their potential systemic toxicity .

Branched chain amino acids (BCAAs): BCAAs include valine, leucine and isoleucine. In cirrhotic patients, the availability of these amino acids is reduced, thus impairing the conversion of ammonia to glutamine in skeletal muscle. A Cochrane review (including 16 RCTs) comparing BCAAs vs. placebo/no intervention, diet, lactulose and neomycin showed that BCAAs had a beneficial effect on HE when trials with a lactulose or neomycin control were excluded, as well as no difference between those interventions when BCAAs and lactulose or neomycin were compared. Additional studies are needed to compare BCAAs with other antibiotics and non-adsorbable disaccharides.

A study conducted by Dr.S. KVirmani, et al., showed that in most of the cases there are different factors which play a key role in precipitating hepatic encephalopathy among them GI bleed, constipation, infections, diuretics, electrolyte

imbalance were the most common precipitating factors. This study dose not include severity of hepatic encephalopathy.

A study conducted by Karin Weissenborn et al., showed that the most serious neurological complication of acute liver failure is the development of devastating brain oedema. Clinically, overt HE is preceded by minimal alterations of cerebral function that can only be detected by neuropsychological or neurophysiological measures, but which nevertheless interfere with the patient's daily living. In contrast to patients with HE, HCV-infected patients did not show motor symptoms or deficits in visual perception, but considerable deficits in attention and concentration ability but this study dose not explain the prognosis.

A study conducted by Muhammad Omar Qureshi et al., showed that that ammonia levels correlated with the severity of hepatic encephalopathy in the study population. Also, majority of patients coming to the study hospital with hepatic encephalopathy were aged above 50 years, HCV as the major cause of their disease, with majority of patients in child class-C but this study dose not explains the precipitating factors.

MATERIALS AND METHODS

Source of Data: A cross-sectional study in the patients treated in the department of general medicine at KLE Dr. Prabhakar Kore Hospital and Research Centre, Belagavi.

Study Design: Cross Sectional Study.

Study Period: January 2023 to December 2023

Sample Size: 128

Sampling technique: According to the study done by **Poordad et al.*** entitled "**Review article: the burden of hepatic encephalopathy**", reported that, the incidence of hepatic encephalopathy occurs in approximately 30–45% of patients with cirrhosis and 10–50% of patients with transjugular intrahepatic portosystemic shunt, while minimal hepatic encephalopathy affects approximately 20–60% of patients with liver disease.

In our institute, we got around 15 patients with cirrhotic hepatic encephalopathy in a month and our study duration is of 12 months. Hence, we can expect to get around 180 cirrhotic hepatic encephalopathy patients during the study period.

So, considering an incidence rate of 30% (hepatic encephalopathy in cirrhotic patients), and population size of 180, we used the following incidence formula for calculating the sample size.

The sample size n and margin of error E are given by:

$$x = Z(c/100)^2 r(100-r)$$

$$n = N\,x/((N-1)E^2 + x)$$

$$E = \mathrm{Sqrt}(N - n)x/n(N-1)$$

where N was the population size (N=180), r was the fraction of responses that you are interested in (r=30%), and Z(c/100) is the critical value for the confidence level c (Z=1.96).

Putting the above values in the above formula, the sample size obtained was 116 cirrhotic hepatic encephalopathy patients in our study at a confidence interval of 95% and 80% power of the study.

Considering an attrition rate of 10%, we intend to include 128 cirrhotic hepatic encephalopathy patients in our study.

Inclusion Criteria:

- Patients with age more than 18 years irrespective of sex with clinical symptoms and signs of hepatic encephalopathy associated with cirrhosis of liver.

Exclusion Criteria:

- Patients of age less than 18 year
- Patients who presented with acute fulminant hepatitis and non-cirrhotic portal hypertension

Study protocol: Patients admitted to the medical wards, presenting with symptoms and signs of hepatic encephalopathy associated with cirrhosis of liver depending on their history, past medical records, clinical signs of cirrhosis liver, an unequivocal ultrasonography and blood ammonia level for biochemical evidence report were taken up for the study.

Data collection procedure:

- Clinical proforma
- West Haven criteria for grading of hepatic encephalopathy
- Child Pugh score to assess the severity and prognosis in cirrhosis of liver
- Blood ammonia levels to provide evidence for hepatic encephalopathy

Statistical Analysis

All the collected data was entered in Microsoft Excel sheet and then transferred to SPSS software ver. 22 for analysis. Qualitative data was presented as frequency and percentages and analysed using chi-square test. Quantitative data was presented as mean and SD and compared by t-test. Correlation between variables was done by using Pearson' s correlation test. P-value < 0.05 was taken as level of significance.

RESULTS

Table no 1 Age group amongst study population

Age group	Frequency	Percent
41 to 50 years	54	42
51 to 60 years	49	38
more than 60 years	26	20
Total	128	100

As seen in the above table, 41 to 50 years (42%) was the most common age group amongst study population followed by 51 to 60 years (38%) and more than 60 years. (20%)

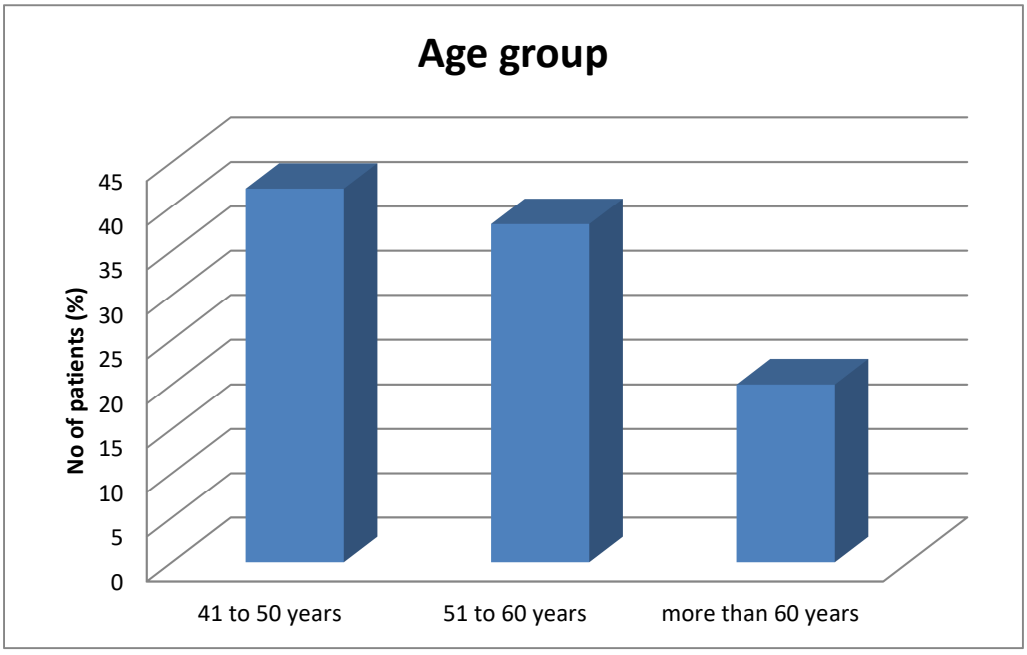


Table no 2 Sex distribution amongst study population

Sex	Frequency	Percent
Female	10	8
Male	118	92
Total	128	100

As seen in the above table, there was higher number of male (92%) as compared to female (8%) amongst study population

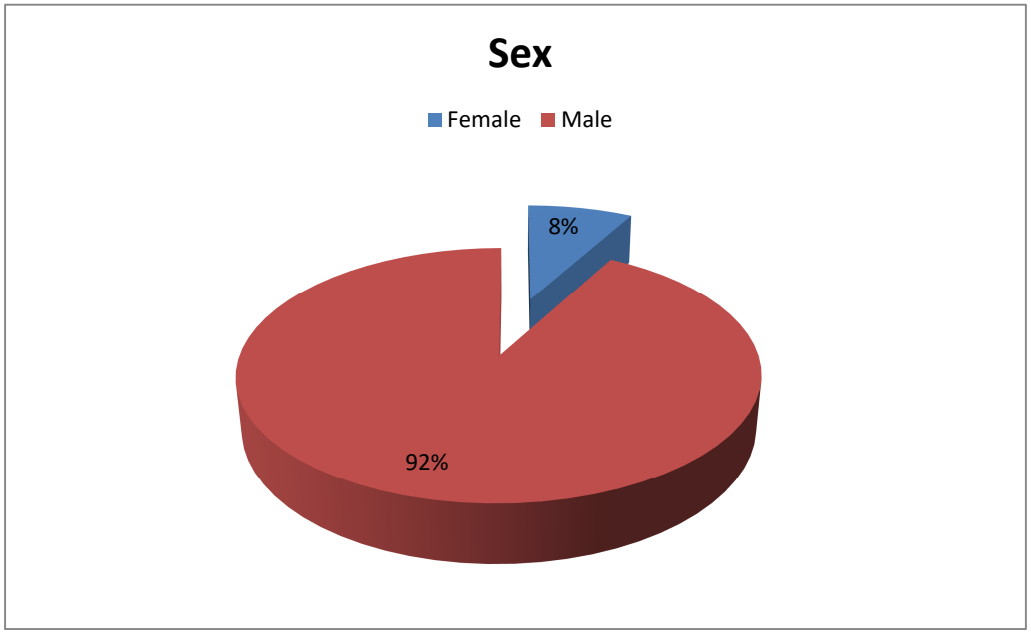


Table no 3 Clinical features amongst study population

Clinical features	Frequency	Percent
Abdominal Distension	31	24.0
Edema Feet	54	42.0
Jaundice	67	52.0
Vomiting	5	4.0
Weakness	15	12.0
Hematemesis	10	8.0
Fever	5	4.0

As seen in the above table, Jaundice (52%) was the most common clinical features amongst study population followed by Edema Feet (42%) and Abdominal Distension. (23%)

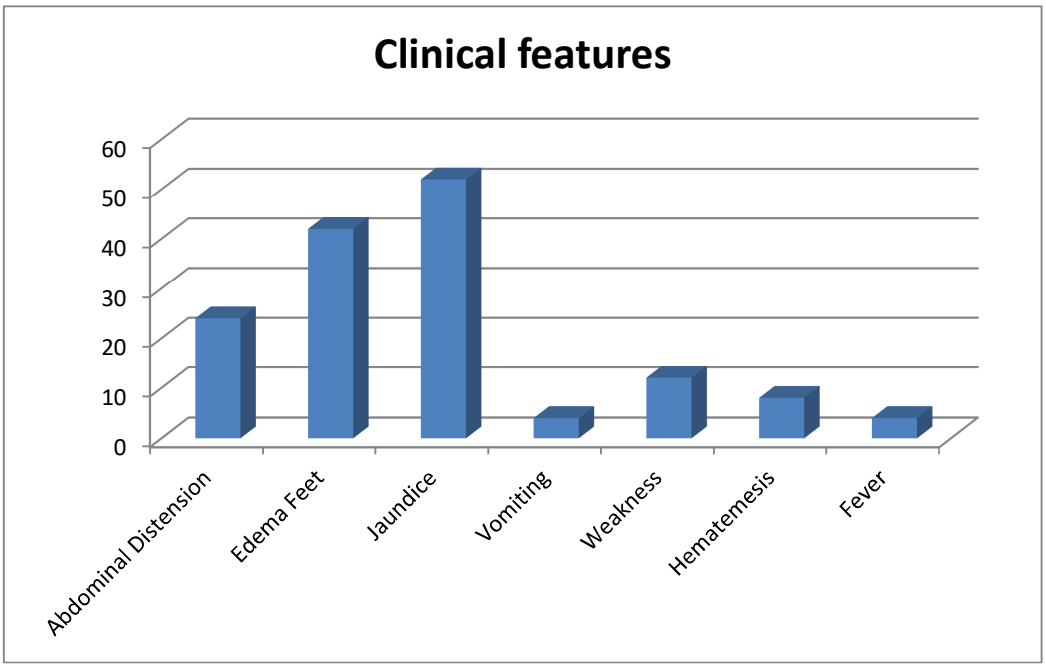


Table no 4 History of alcoholism amongst study population

Past History/History Of Alcoholism	Frequency	Percent
Yes	49	38
No	79	62
Total	128	100

As seen in the above table, history of alcoholism was present in 38% of study population

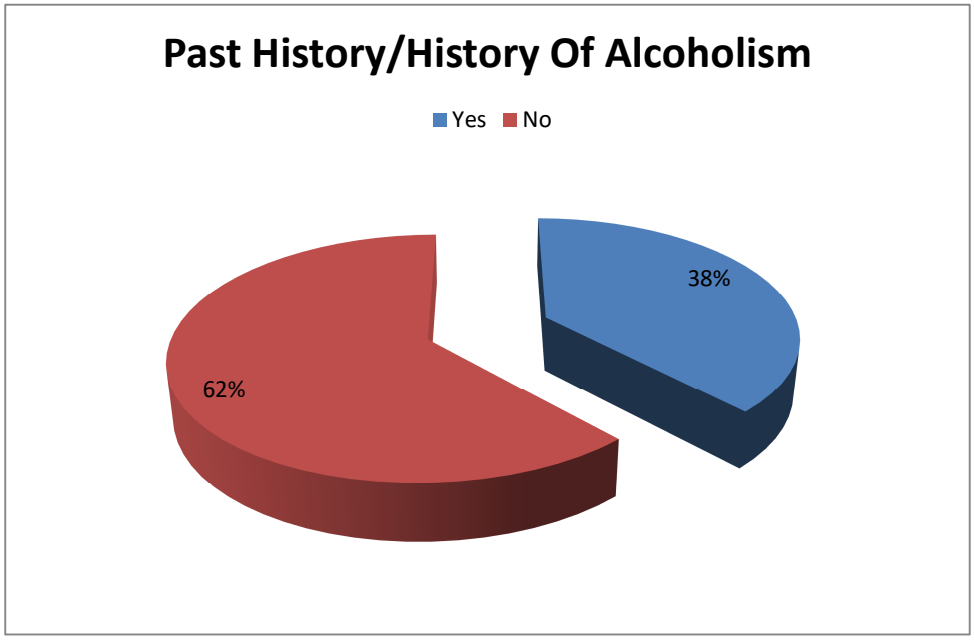


Table no 5 General examination findings amongst study population

General Examination findings	Frequency	Percent
Edema Feet	118	92
Icterus	110	86

As seen in the above table, Edema Feet and Icterus was present in 92% and 86% of study population on general examination findings.

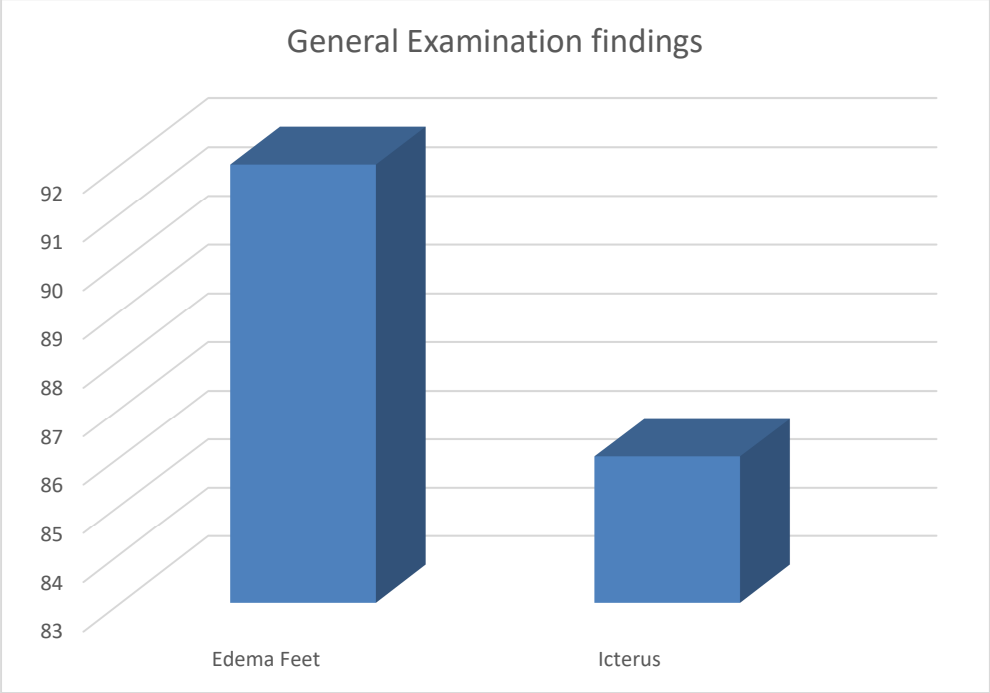


Table no 6 CNS examination findings amongst study population

Central Nervous System Examination	Frequency	Percent
Comatose	26	20
Conscious, altered Sleep Cycle	10	8
Conscious, asterixis Present	15	12
Conscious, Confused	5	4
Conscious, Disoriented To Time Place Person	15	12
Conscious, Incoherent Speech	3	2
Conscious, Oriented To Time Place Person	15	12
Drowsy, Irrelevant Speech	38	30
Total	128	100

As seen in the above table, most of the study population were drowsy with irrelevant speech (30%) followed by comatose (20%) and conscious, asterixis (12%) , conscious, oriented to time place person (12%)

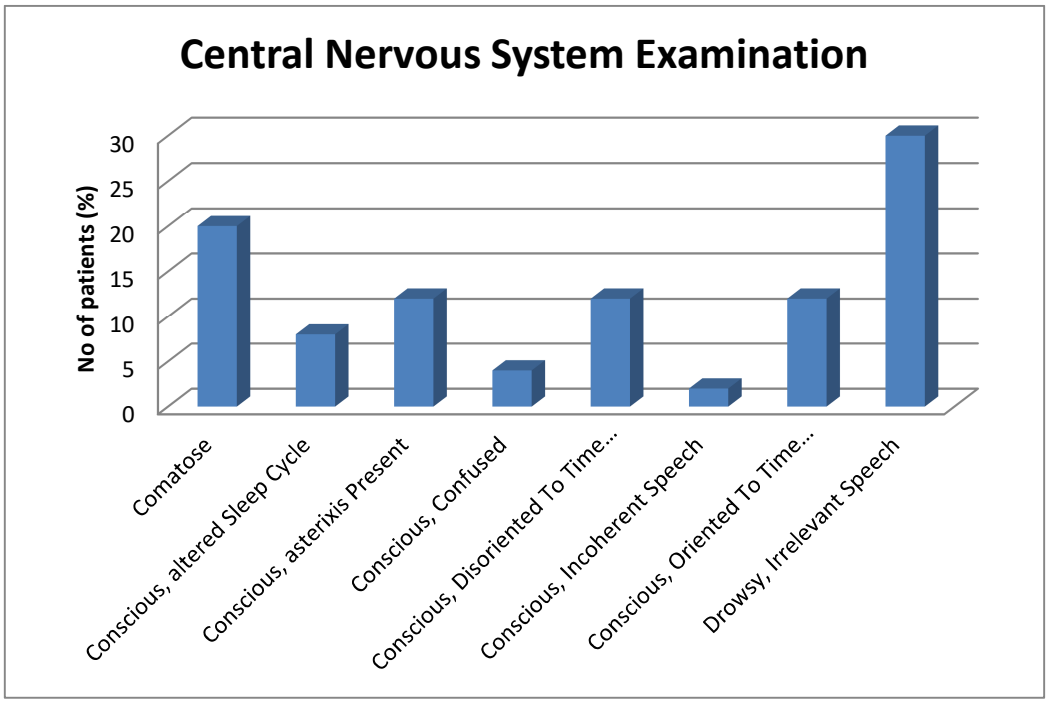


Table no 7 Per Abdomen examination findings amongst study population

Per Abdomen Examination	Frequency	Percent
Distended Ascites	72	56
Soft Non Tender	56	44
Total	128	100

As seen in the above table, distended ascites and soft non tender was present in 56% and 44% of study population on abdomen examination

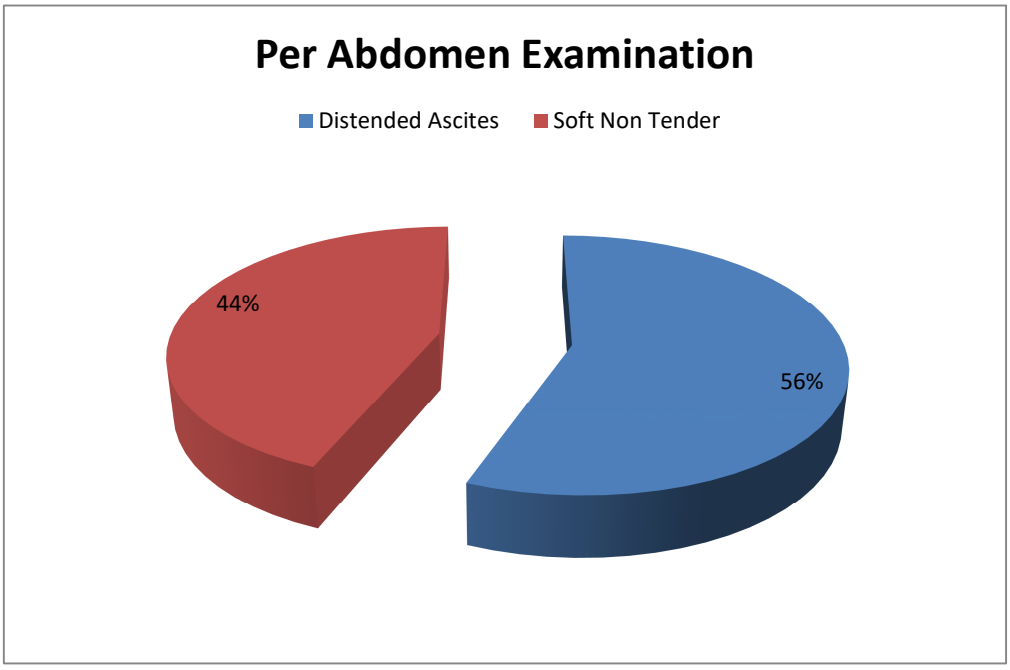


Table no 8 Liver surface findings amongst study population

Liver surface	Frequency	Percent
Irregular Liver Surface	33	26
Nodular Liver Surface	95	74
Total	128	100

As seen in the above table, irregular and nodular liver surface was present in 26% and 74% of study population

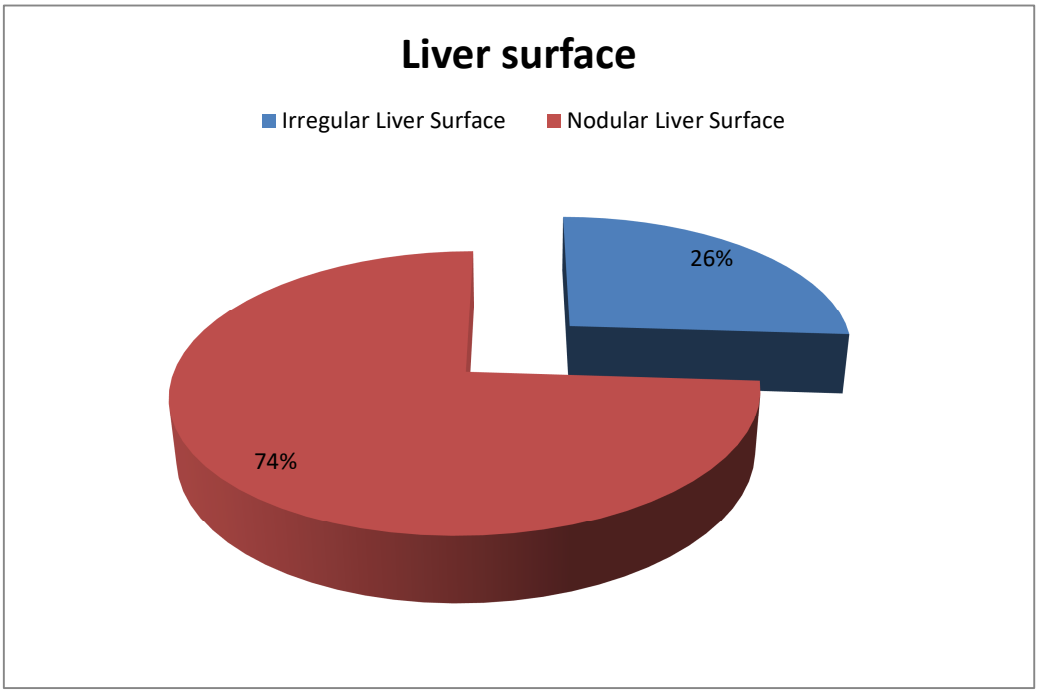


Table no 9 Ascitis amongst study population

Ascitis	Frequency	Percent
No Ascites	10	8
Mild Ascites	46	36
Moderate Ascites	72	56
Total	128	100

As seen in the above table, mild and moderate ascites was present in 36% and 56% of study population

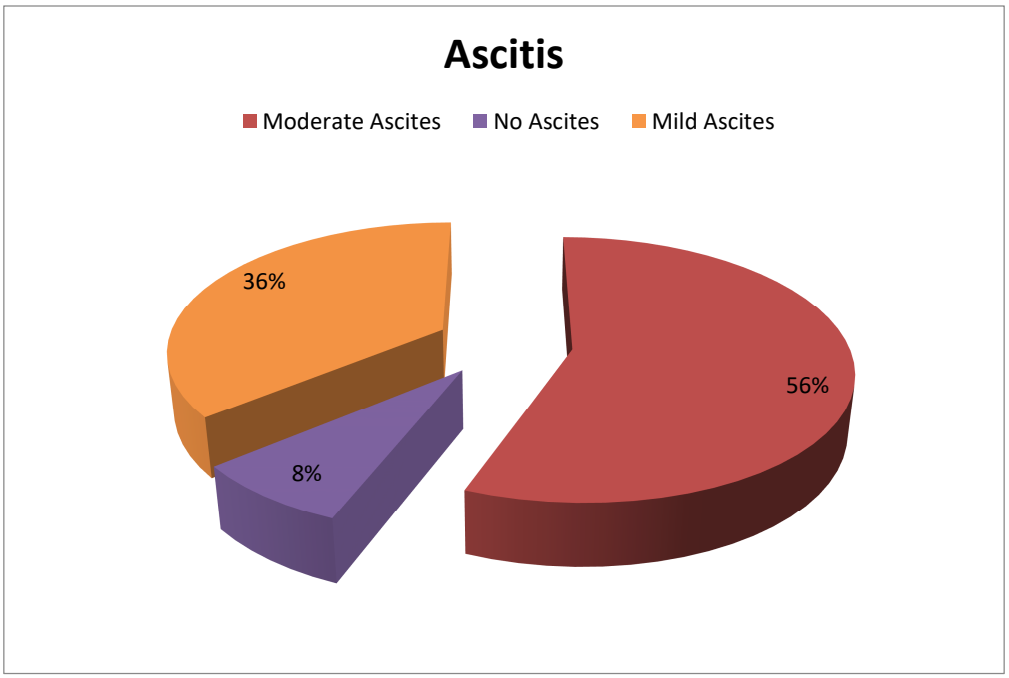


Table no 10 HbsAg amongst study population

HbsAg	Frequency	Percent
Positive	8	6
Negative	120	94
Total	128	100

As seen in the above table, HbsAg was positive in 6% of study population

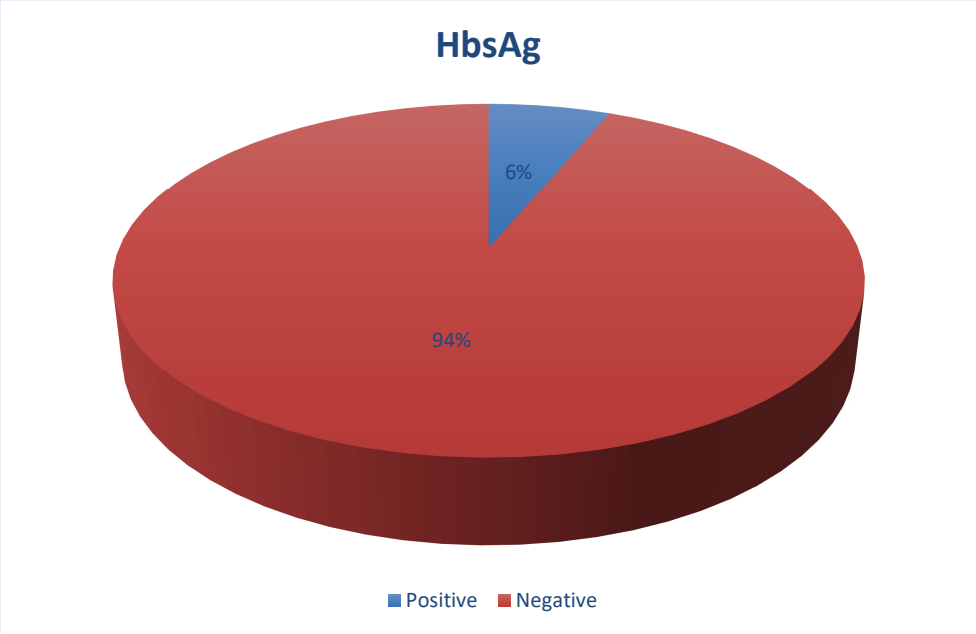


Table no 11 Anti HCV amongst study population

Anti HCV	Frequency	Percent
Negative	117	91
Positive	11	9
Total	128	100

As seen in the above table, Anti HCV was positive in 9% of study population

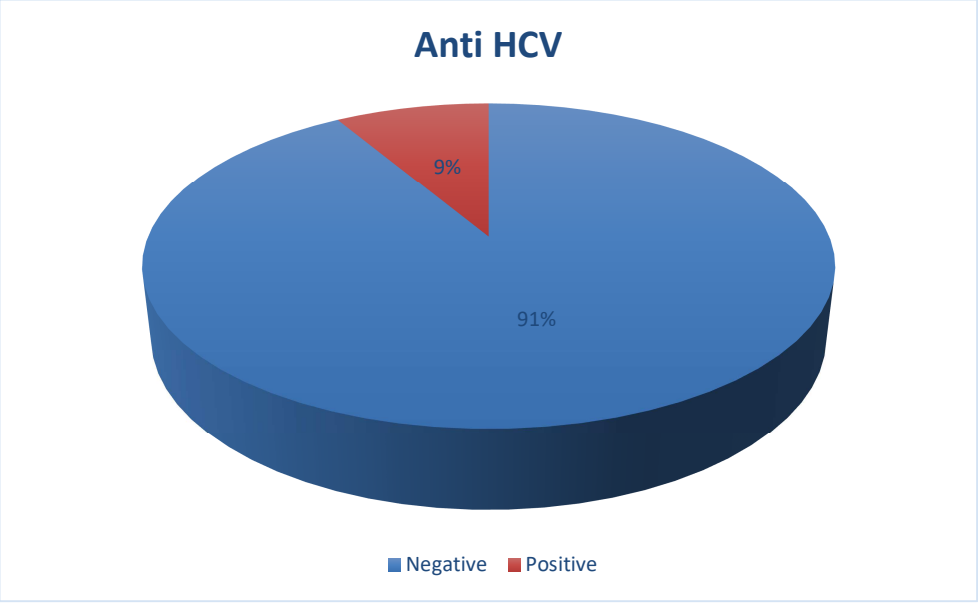


Table no 12 Encephalopathy Grade amongst study population

Encephalopathy Grade	Frequency	Percent
Absent Encephalopathy	13	10
Grade1	13	10
Grade2	44	34
Grade 3	26	20
Grade 4	33	26
Total	128	100

As seen in the above table, most of the study population had Grade 2 Encephalopathy (34%) followed by grade 4 (26%) and grade 3 (20%)

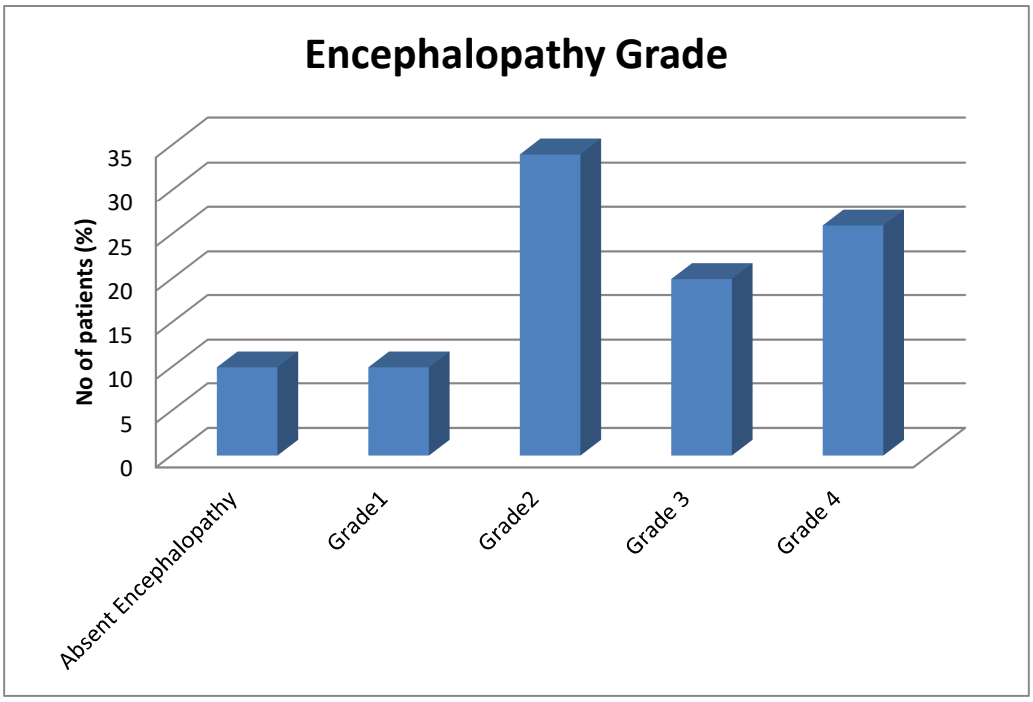


Table no 13 Age and hospital stay (Mean and Std. Deviation) amongst study population

	Mean	Std. Deviation
Age(Years)	52.32	6.702
Duration of hospital stay(days)	5.32	2.084

As seen in the above table, the mean age and duration of hospital stay(days) amongst study population was 52.32 ± 6.7years and 5.32 ± 2.08 days respectively

Table no 14 General examinations findings amongst study population

General examinations findings	Mean	Std. Deviation
Pulse(Per Min)	80.88	5.427
Systolic Blood Pressure(mm of Hg)	110	7.1
Diasystolic Blood Pressure(mm of Hg)	70.92	7.594

As seen in the above table, the mean Pulse , SBP and DBP, amongst study population was 80.88 ± 5.4, 110 ± 7.1 and 70.92 ± 7.5 respectively

Table no 15 Hematological parameters amongst study population

Hematological parameters	Mean	Std. Deviation
Hemoglobin(gm/dl)	10.98	1.07
WBC	6604.00	1679.2
Platelets	172460.00	53159.4
BUN(mg/dl)	16.96	2.6
Serum Creatinine(mg/dl)	1.23	0.29
PT	14.28	5.5
INR	2.27	0.79

As seen in the above table, the mean hemoglobin , WBC , Platelets , BUN(mg/dl), Serum Creatinine(mg/dl), PT and INR amongst study population was 10.98 ± 1, 6604 ± 1679, 172460 ± 53159, 16.96 ± 2.6 , 1.23 ± 0.2 , 14.28 ± 5.5 and 2.27 ± 0.79 respectively

Table no 16 LFT findings amongst study population

LFT	Mean	Std. Deviation
Total Bilirubin(mg/dl)	5.99	3.03
SGOT	168.38	75.53
SGPT	202.64	71.77
Serum Albumin(gm/dl)	2.83	0.71
Total Serum Proteins (gm/dl)	6.07	0.39

As seen in the above table, the mean total bilirubin , SGOT, SGPT , serum albumin and total serum protein amongst study population was 5.99 ± 3.03, 168 ± 75 .53 , 202 ± 71.77, 2.83 ± 0.71 , and 6.07 ± 0.39 respectively.

Table no 17 Precipitating factors of study patients with hepatic encephalopathy

Precipitating factors	Frequency	Percent
Spontaneous bacterial peritonitis	11	8.5
Respiratory tract infection	18	14.2
Urinary tract infection	25	19.2
Dyselectrolytemia	44	34.5
Constipation	28	21.8
Gastrointestinal bleeding	24	18.8

As seen in the above table, the distribution of precipitating factors among the study population reveals a diverse range of contributors to the condition under examination. Dyselectrolytemia emerges as the most prevalent factor, accounting for 34.5% of cases, followed by urinary tract infections at 19.2% and constipation at 21.8%. Respiratory tract infections and spontaneous bacterial peritonitis are less common, observed in 14.2% and 8.5% of cases, respectively. Gastrointestinal bleeding is also notable, contributing to 18.8% of cases.

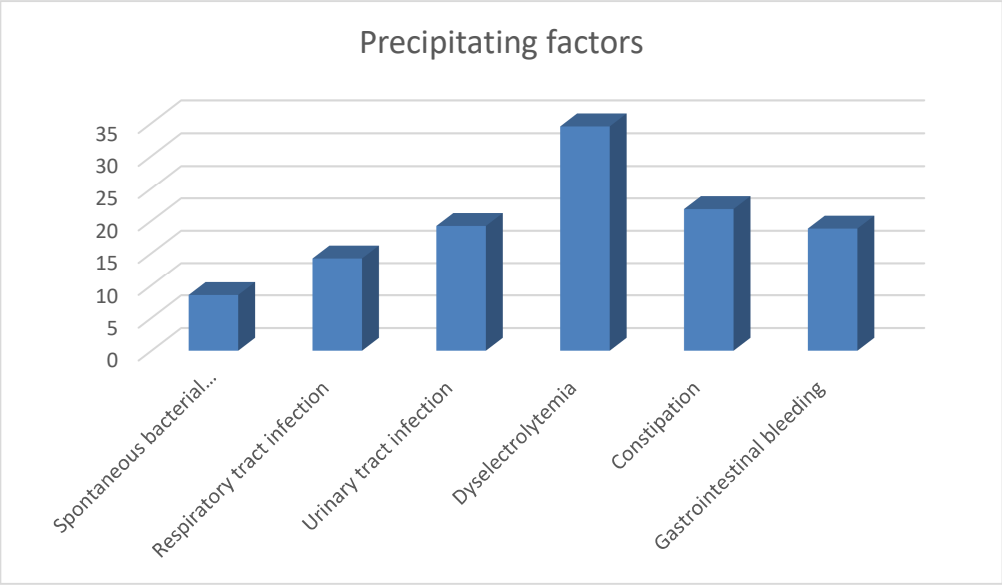
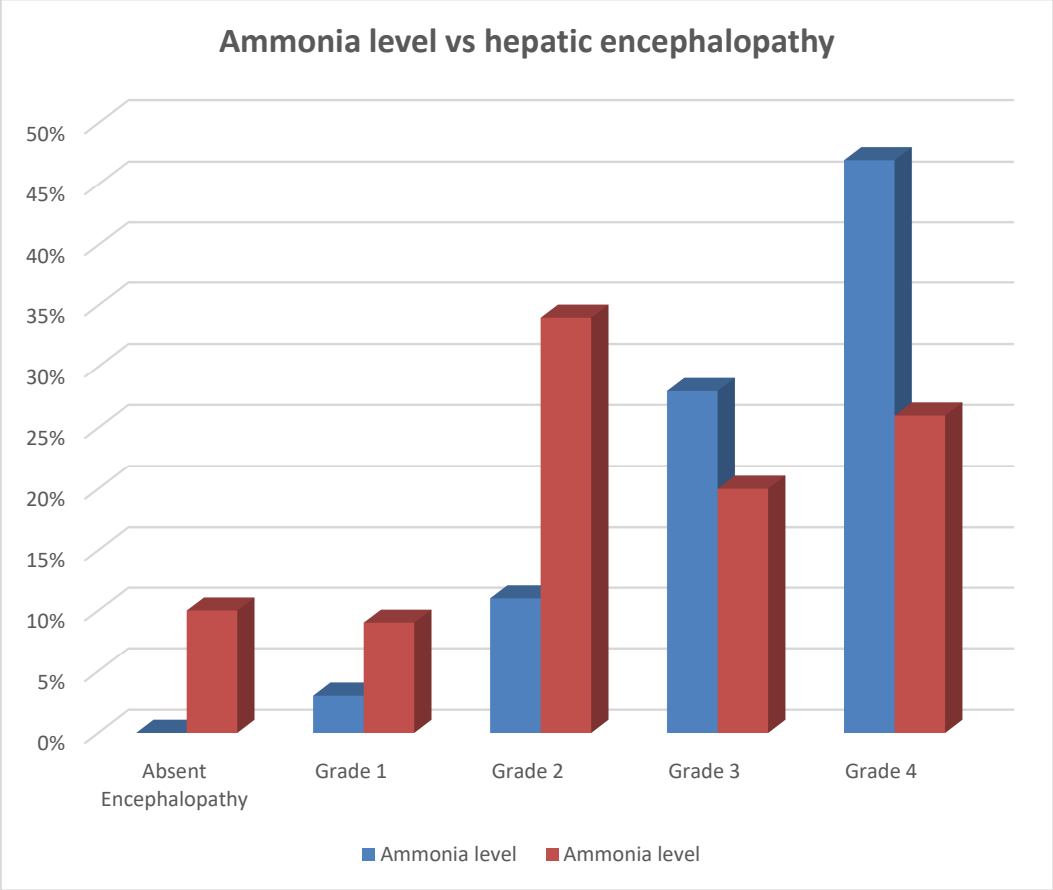


Table no 18 Ammonia level vs hepatic encephalopathy

Encephalopathy Grade	Ammonia level		Total
	Raised	Normal	
Absent Encephalopathy	0 (0%)	13 (10%)	13 (10%)
Grade 1	2 (3%)	11 (9%)	13 (10%)
Grade 2	7 (11%)	37 (34%)	44 (34%)
Grade 3	17 (28%)	9 (20%)	26 (20%)
Grade 4	28 (47%)	5 (26%)	33 (26%)
Total	61 (100%)	67 (100%)	128 (100%)

Chi square test, P value- 0.001

As seen in the above table, the data shows that among 128 patients, the distribution of ammonia levels varies significantly across different grades of encephalopathy. For patients without encephalopathy (10%), none had raised ammonia levels, while all had normal levels. In Grade 1 encephalopathy (10%), 3% had raised ammonia, and 9% had normal levels. Grade 2 encephalopathy (34%) showed 11% with raised ammonia and 34% with normal levels. For Grade 3 encephalopathy (20%), 28% had raised ammonia, and 20% had normal levels. The most severe, Grade 4 encephalopathy (26%), had the highest percentage of raised ammonia levels at 47%, with 26% having normal levels. Overall, 48% of patients had raised ammonia levels, while 52% had normal levels, indicating a trend where higher grades of encephalopathy are associated with increased ammonia levels.


Ammonia level vs hepatic encephalopathy
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Absent Encephalopathy
Grade 1
Grade 2
Grade 3
Grade 4
Ammonia level
Ammonia level

DISCUSSION

Cirrhosis of liver is a common medical problem in India. HBV infection is a well recognized etiological factor in the causation of cirrhosis. However, cases of HCV infection is also being recognized more commonly now with the advent of better testing facility like third generation ELISA for HCV antibodies. Cirrhosis causes prolonged morbidity and can occur at any age group. A number of reports from the West and Japan, it was found that less than 5% of cirrhosis was under 30-35 years of age.

In the present study, the most common age group amongst study population was 41 to 50 years (42%) followed by 51 to 60 years (38%) and more than 60 years (20%) with the mean age of 52.32 ± 6.07 years and there was higher number of male (92%) as compared to female (8%) amongst study population. This findings correlate well with the study conducted by Jong Hoon Kim et al., in which mean age of study population was 55.8 ± 11.6 years and males predominance (70.97%) . The mean age of patients from other studies are as follows; 57.9 years by Andreu et al from Spain, 54.1years by Toledo et al from Barcelona ,58.5 years by Guarner et al from Spain. Aparna Agarwal from north India noted mean age of 50.7years.

In the present study, the most common clinical features amongst study population was Jaundice (52%) followed by Edema Feet (42%) and Abdominal Distension. (23%). This findings correlate well with the study conducted by R Maskey et al., in which Jaundice and Abdominal Distension was present in 84.4% and 84.4% of study population

In the present study, history of alcoholism was present in 38% of study population, This findings correlate well with the study conducted by Chakravarthy C,1999 in which the prevalence of alcohol use varies between 33% and 50%.

In the present study, HbsAg and Anti HCV was positive in 6% and 9% of study population. Similarly in the study conducted by Ravi B. Nagarajaiah et al., on analysing the risk factors for the development of cirrhosis, it was found that 75% were alcoholics. In the study conducted by Andreu et al from Spain alcohol was noted in 81%,70% by Guarner et al 261 and 67% by Rajesh Baheti et al from jodhpur. The next common cause in our study was viral hepatitis and HBV was the cause in 20% which was similar to that reported by Guarner et al ., from Spain however another study from Spain reported HBV in only 5%. Aparna Agarwal et al from north India has reported HBV in 22% of patients .Hence different Indian studies have shown the percentage of viral infection to range from 20-38%. In our study HCV was found to be 6.06% while Sarin et al 267 from New Delhi reported it to be 10.8%. however Rajesh Baheti et al and Sanyal et al reported it to be 29.4% and 21.5% respectively.

In the present study, most of the study population had Grade 2 Encephalopathy (34%) followed by grade 4 (26%) and grade 3 (20%)

In the present study, the mean age and duration of hospital stay(days) amongst study population was 52.32 ± 6.7years and 5.32 ± 2.08 days respectively

In the present study, the mean hemoglobin, WBC, Platelets, BUN(mg/dl), Serum Creatinine(mg/dl), PT and INR amongst study population was 10.98 ± 1, 6604 ± 1679 , 172460 ± 53159, 16.96 ± 2.6 , 1.23 ± 0.2 , 14.28 ± 5.5 and 2.27 ±

0.79 respectively . Similarly findings were observed in the study conducted by Ravi B. Nagarajaiah et al..

In the present study, the mean total bilirubin , SGOT, SGPT , serum albumin and total serum protein amongst study population was 5.99 ± 3.03, 168 ± 75 .53 , 202 ± 71.77, 2.83 ± 0.71 , and 6.07 ± 0.39 respectively. Similarly findings were observed in the study conducted by Ravi B. Nagarajaiah et al., in which all the LFT values were raised.

In the present study, the distribution of precipitating factors among the study population reveals a diverse range of contributors to the condition under examination. Dyselectrolytemia emerges as the most prevalent factor, accounting for 34.5% of cases, followed by urinary tract infections at 19.2% and constipation at 21.8%. Respiratory tract infections and spontaneous bacterial peritonitis are less common, observed in 14.2% and 8.5% of cases, respectively. Gastrointestinal bleeding is also notable, contributing to 18.8% of cases. Our finding is, however, contradicting studies done in the USA by Souheil et al., who observed that infections were responsible in only 3% of cases. This could be related to adherence to therapy and regular monitoring of patients with LC in the USA, which resulted in early detection and treatment of infections.

In our study, we observed electrolyte imbalance to be present in 34.5% patients, and among electrolyte disorders, hyponatremia was much more common than hypokalemia in our patients, which was in agreement with other studies, such as Abid et al. and Alam et al.

Constipation was seen in 21.8% in our study, which was consistent with the study by Abid et al. who reported that 21.7% of patients had constipation. However, our finding contradicts the study done by Zakaria et al., who reported constipation as a precipitating factor in only 7% of patients. Gastrointestinal bleeding (GIB) was identified only in 18.8% in our study, which is similar to the study done by Souheil et al., who also reported GIB in 18% of cases. This was contrary to the findings of Bustamante et al. and Mehboob et al., who reported that GIB was the second and third commonest precipitating factor, respectively. This can be attributed to a larger number of patients with large varices, which carry the risk of variceal bleed.

In a study by Devrajani *et al.*, the most common precipitating factors detected were infections and constipation. In this study, majority of the patients belongs to CTP Class C. Panchili and Thomas investigated and found constipation, spontaneous bacterial peritonitis, and urinary tract infection as the most rampant precipitating factor for HE. They also summarized that patients who have multiple precipitating factors for encephalopathy have delayed recovery and high mortality. In a scrutiny by Dhande *et al.*, upper GI bleed was the most common precipitating factor for HE followed by constipation. Author also established that 18.4% of patients had multiple precipitating factors for HE. 278 In a study from Nigeria, the common precipitating factor identified for HE were sepsis 29% and GI bleed 24%.

In the present study, patients without encephalopathy (10%), none had raised ammonia levels, while all had normal levels. In Grade 1 encephalopathy (10%), 3% had raised ammonia, and 9% had normal levels. Grade 2 encephalopathy (34%) showed 11% with raised ammonia and 34% with normal levels. For Grade 3 encephalopathy (20%), 28% had raised ammonia, and 20% had normal levels. The

most severe, Grade 4 encephalopathy (26%), had the highest percentage of raised ammonia levels at 47%, with 26% having normal levels. Overall, 48% of patients had raised ammonia levels, while 52% had normal levels, indicating a trend where higher grades of encephalopathy are associated with increased ammonia levels.

CONCLUSION

The study population, predominantly aged between 41 to 60 years, exhibited a higher proportion of males and presented with clinical features such as jaundice, edema feet, and abdominal distension. Alcoholism history was prevalent, alongside positive findings for HbsAg and Anti HCV. Encephalopathy, particularly Grade 2, was common, with irregular and nodular liver surfaces noted in a significant portion. The mean age and duration of hospital stay were relatively high, indicating prolonged medical care needs. Hematological and biochemical parameters, including liver function tests, revealed derangements consistent with hepatic dysfunction. Additionally, diverse precipitating factors, notably dyselectrolytemia, underscored the multifactorial nature of the condition. Overall, the findings highlight the complexity of liver-related pathologies in this population, necessitating comprehensive management strategies tailored to individual patient needs.

SUMMARY

- The most common age group amongst study population was 41 to 50 years (42%) was followed by 51 to 60 years (38%) and more than 60 years. (20%)
- There was higher number of male (92%) as compared to female (8%) amongst study population
- Jaundice (52%) was the most common clinical features amongst study population followed by Edema Feet (42%) and Abdominal Distension. (23%)
- History of alcoholism was present in 38% of study population
- Edema Feet and Icterus was present in 86% and 86% of study population on general examination findings.
- Most of the study population were drowsy with irrelevant speech (30%) followed by comatose (20%) and conscious, asterixis (12%) , conscious, oriented to time place person (12%)
- Irregular and nodular liver surface was present in 26% and 74% of study population
- HbsAg and Anti HCV was positive in 6% and 9% of study population
- Most of the study population had Grade 2 Encephalopathy (34%) followed by grade 4 (26%) and grade 3 (20%)
- The mean age and duration of hospital stay(days) amongst study population was 52.32 ± 6.7years and 5.32 ± 2.08 days respectively
- The mean Pulse , SBP and DBP , amongst study population was 80.88 ± 5.4, 110 ± 7.1 and 70.92 ± 7.5 respectively
- The mean hemoglobin , WBC , Platelets , BUN(mg/dl), Serum Creatinine(mg/dl), PT and INR amongst study population was 10.98 ± 1,

6604 ± 1679 , 172460 ± 53159, 16.96 ± 2.6 , 1.23 ± 0.2 , 14.28 ± 5.5 and 2.27 ± 0.79 respectively

- The mean total bilirubin , SGOT, SGPT, serum albumin and total serum protein amongst study population was 5.99 ± 3.03, 168 ± 75 .53 , 202 ± 71.77, 2.83 ± 0.71 , and 6.07 ± 0.39 respectively
- The distribution of precipitating factors among the study population reveals a diverse range of contributors to the condition under examination. Dyselectrolytemia emerges as the most prevalent factor, accounting for 34.5% of cases, followed by urinary tract infections at 19.2% and constipation at 21.8%. Respiratory tract infections and spontaneous bacterial peritonitis are less common, observed in 14.2% and 8.5% of cases, respectively. Gastrointestinal bleeding is also notable, contributing to 18.8% of cases.

- For patients without encephalopathy (10%), none had raised ammonia levels, while all had normal levels. In Grade 1 encephalopathy (10%), 3% had raised ammonia, and 9% had normal levels. Grade 2 encephalopathy (34%) showed 11% with raised ammonia and 34% with normal levels. For Grade 3 encephalopathy (20%), 28% had raised ammonia, and 20% had normal levels. The most severe, Grade 4 encephalopathy (26%), had the highest percentage of raised ammonia levels at 47%, with 26% having normal levels. Overall, 48% of patients had raised ammonia levels, while 52% had normal levels, indicating a trend where higher grades of encephalopathy are associated with increased ammonia levels.

BIBLIOGRAPHY

1. Gines P, Guevara M. Hyponatremia in cirrhosis: pathogenesis, clinical significance, and management. Hepatology 2008;48:1002.
2. Mauro B, Carmen S, Luca Santi. Hyponatremia in Patients with Cirrhosis of the Liver. J. Clin. Med. 2015;4:85-101
3. Adrogue H, Madias N. Hyponatremia. N Engl J Med 2000;342:1581–89.
4. European Association for the Study of the Liver. EASL clinical practice guidelines on the management of ascites, spontaneous bacterial peritonitis, and hepatorenal syndrome in cirrhosis. J Hepatol 2010;53:397–417.
5. Gines P, Berl T, Bernardi M, Bichet DG, Hamon G, Jimenez W. Hyponatremia in cirrhosis: from pathogenesis to treatment. Hepatology. 1998;28: 851–864.
6. Angeli P, Wong F, Watson H, Gines P. Hyponatremia in cirrhosis : results of a patient population survey. Hepatology. 2006;44:1535–1542.
7. Bengus A, Babiuc R. Hyponatremia – predictor of adverse prognosis in cirrhosis. Journal of Medicine and Life. 2012;5(2):176-178
8. Robert G, Andres C. Hyponatraemia and cirrhosis. Gastroenterology Report 2. 2014:21–26
9. Ahluwalia V, Wade J, Thacker L,Kraft K, Sterling R, Stravitz Ret al. Differential impact of hyponatremia and hepatic encephalopathy on health-related quality of life and brain metabolite abnormalities in cirrhosis. J Hepatol 2013;59:467–73.
10. Moreau R. Hyponatremia in cirrhosis : Pathophysiology, prevalence, prognostic value & treatment. Acta Gastroenterol Belg. 2008;71(4):379–385.

11. Mamun A, Mridha M, Alam K, AsrafM, Ferdoushi S, Majid F. Correlation between the serum sodium and the severity of liver disease in cirrhotic patients. Bangladesh Med J. 2013;42 (3);73-77
12. Levesque E, Hoti E, Azoulay D, Ichaï P, Habouchi H, Castaing D et al. Prospective evaluation of the prognostic scores for cirrhotic patients admitted to an Intensive Care Unit. Journal of Hepatology.2012; 56 : 95–102.
13. Anthony P,P Ishak, K.G Nayak, N.C. Poulsen, H.E. Scheuer,P.J.& Sobin L.H. The morphology of cirrhosis. J Clin Pathol1978; 31: 395-414.
14. Friedman SL. Hepatic fibrosis. In Schiff ER, Sorrell MF,Maddrey WC, editors. Schiff's Diseases of the Liver. (8th ed.).Philadelphia: Lippincott-Raven 1999: 371-85.)
15. Schuppan D, Afdhal NH. Liver cirrhosis. Lancet 2008; 371: 838–51.
16. Dooley J, Lok A, Burroughs AK, Heathcote E, eds. Sherlock's diseases of the liver and biliary system, 12th edn. Oxford: Wiley-Blackwell, 2011.
17. D'Amico G, Garcia-Tsao G, Pagliaro L. Natural history and prognostic indicators of survival in cirrhosis: a systematic review of 118 studies. J Hepatol 2006; 44: 217–31.
18. Hytiroglou P, Snover DC, Alves V, et al. Beyond "cirrhosis": a proposal from the International Liver Pathology Study Group. Am J Clin Pathol 2012; 137: 5–9.
19. Marcellin P, Gane E, Buti M, et al. Regression of cirrhosis during treatment with tenofovir disoproxil fumarate for chronic hepatitis B: a 5-year open-label follow-up study. Lancet 2013; 381: 468–75.

20. Morgan TR, Ghany MG, Kim HY, et al, and the HALT-C Trial Group. Outcome of sustained virological responders with histologically advanced chronic hepatitis C. Hepatology 2010; 52: 833–44.
21. Taha HA, Waked IA. Liver disease on the Nile: an association since millennia. Nile Liver Journal. 2010;1(1):1-6.
22. McGee SR. Evidence-Based Physical Diagnosis. St. Louis, Mo.: Saun-ders-Elsevier; 2007:80.
23. Heidelbaugh JJ, Bruderly M, Cirrhosis and chronic liver failure: Part I. Diagnosis and evaluation. Am Fam Physician. 2006;74(5):756-762.
24. Abstracts of the Biennial Meeting of the International Association for the Study of the Liver, April 15-16, 2002 and the 37th Annual Meet-ing of the European Association for the Study of the Liver, April 18-21, 2002. Madrid, Spain. J Hepatol. 2002;36(suppl 1):1-298.
25. Wanless IR, Wong F, Blendis LM, Greig P, Heathcote EJ, Levy G. Hepatic and portal vein thrombosis in cirrhosis: possible role in development of parenchymal extinction and portal hypertension. Hepatology 1995; 21: 1238–47.
26. Fernández M, Semela D, Bruix J, Colle I, Pinzani M, Bosch J. Angiogenesis in liver disease. J Hepatol 2009; 50: 604–20.
27. García-Pagán JC, Gracia-Sancho J, Bosch J. Functional aspects on the pathophysiology of portal hypertension in cirrhosis. J Hepatol 2012; 57: 458–61.
28. Cholongitas E, Quaglia A, Samonakis D, et al. Transjugular liver biopsy: how good is it for accurate histological interpretation? Gut 2006; 55: 1789–94.

29. Castera L. Noninvasive methods to assess liver disease in patients with hepatitis B or C. Gastroenterology 2012; 142: 1293–302, e4.

30. Arvaniti V, D'Amico G, Fede G, et al. Infections in patients with cirrhosis increase mortality four-fold and should be used in determining prognosis. Gastroenterology 2010; 139: 1246–56.e5.

31. Fede G, D'Amico G, Arvaniti V, et al. Renal failure and cirrhosis: a systematic review of mortality and prognosis. J Hepatol 2012; 56: 810–18.

32. Moreau R, Jalan R, Gines P, et al, and the CANONIC Study Investigators of the EASL–CLIF Consortium. Acute-on-chronic liver failure is a distinct syndrome that develops in patients with acute decompensation of cirrhosis. Gastroenterology 2013; 144: 1426–37, e1–9.

33. Kim SU, Oh HJ, Wanless IR, Lee S, Han KH, Park YN. The Laennec staging system for histological subclassification of cirrhosis is useful for stratification of prognosis in patients with liver cirrhosis. J Hepatol 2012; 57: 556–63.

34. Manousou P, Dhillon AP, Isgro G, et al. Digital image analysis of liver collagen predicts clinical outcome of recurrent hepatitis C virus 1 year after liver transplantation. Liver Transpl 2011; 17: 178–88.

35. Parkes J, Roderick P, Harris S, et al. Enhanced liver fi brosis test can predict clinical outcomes in patients with chronic liver disease. Gut 2010; 59: 1245–51.

36. Vergniol J, Foucher J, Terrebonne E, et al. Noninvasive tests for fi brosis and liver stiff ness predict 5-year outcomes of patients with chronic hepatitis C. Gastroenterology 2011; 140: 1970–79, e1–3.

37. Rein DB, Smith BD, Wittenborn JS, et al. The cost-eff ectiveness of birth-cohort screening for hepatitis C antibody in U.S. primary care settings. Ann Intern Med 2012; 156: 263–70.

38. Angulo P, Hui JM, Marchesini G, et al. The NAFLD fi brosis score: a noninvasive system that identifies liver fibrosis in patients with NAFLD. Hepatology 2007; 45: 846–54.

39. Sheron N, Moore M, Ansett S, Parsons C, Bateman A. Developing a 'traffi c light' test with potential for rational early diagnosis of liver fibrosis and cirrhosis in the community. Br J Gen Pract 2012; 62: 616–24.

40. Roulot D, Costes JL, Buyck JF, et al. Transient elastography as a screening tool for liver fi brosis and cirrhosis in a community-based population aged over 45 years. Gut 2011; 60: 977–84.

41. Tsochatzis EA, Gurusamy KS, Ntaoula S, Cholongitas E, Davidson BR, Burroughs AK. Elastography for the diagnosis of severity of fi brosis in chronic liver disease: a meta-analysis of diagnostic accuracy. J Hepatol 2011; 54: 650–59.

42. Naveau S, Giraud V, Borotto E, Aubert A, Capron F, Chaput JC. Excess weight risk factor for alcoholic liver disease. Hepatology 1997; 25: 108–11.

43. Tsochatzis E, Papatheodoridis GV, Manesis EK, Kafiri G, Tiniakos DG, Archimandritis AJ. Metabolic syndrome is associated with severe fi brosis in chronic viral hepatitis and non-alcoholic steatohepatitis. Aliment Pharmacol Ther 2008; 27: 80–89.

44. Berzigotti A, Garcia-Tsao G, Bosch J, et al, and the Portal Hypertension Collaborative Group. Obesity is an independent risk factor for clinical decompensation in patients with cirrhosis. Hepatology 2011; 54: 555–61.

45. Stepanova M, Rafi q N, Younossi ZM. Components of metabolic syndrome are independent predictors of mortality in patients with chronic liver disease: a population-based study. Gut 2010; 59: 1410–15.

46. Nkontchou G, Bastard JP, Ziol M, et al. Insulin resistance, serum leptin, and adiponectin levels and outcomes of viral hepatitis C cirrhosis. J Hepatol 2010; 53: 827–33.

47. El-Serag HB, Tran T, Everhart JE. Diabetes increases the risk of chronic liver disease and hepatocellular carcinoma. Gastroenterology 2004; 126: 460–68.

48. Welzel TM, Graubard BI, Zeuzem S, El-Serag HB, Davila JA, McGlynn KA. Metabolic syndrome increases the risk of primary liver cancer in the United States: a study in the SEER-Medicare database. Hepatology 2011; 54: 463–71.

49. Plank LD, Gane EJ, Peng S, et al. Nocturnal nutritional supplementation improves total body protein status of patients with liver cirrhosis: a randomized 12-month trial. Hepatology 2008; 48: 557–66.

50. Luca A, García-Pagán JC, Bosch J, et al. Eff ects of ethanol consumption on hepatic hemodynamics in patients with alcoholic cirrhosis. Gastroenterology 1997; 112: 1284–89.

51. European Association for the Study of Liver. EASL clinical practical guidelines: management of alcoholic liver disease. J Hepatol 2012; 57: 399–420.

52. Westin J, Lagging LM, Spak F, et al. Moderate alcohol intake increases fi brosis progression in untreated patients with hepatitis C virus infection. J Viral Hepat 2002; 9: 235–41.

53. Forner A, Llovet JM, Bruix J. Hepatocellular carcinoma. Lancet 2012; 379: 1245–55.

54. Ascha MS, Hanouneh IA, Lopez R, Tamimi TA, Feldstein AF, Zein NN. The incidence and risk factors of hepatocellular carcinoma in patients with nonalcoholic steatohepatitis. Hepatology 2010; 51: 1972–78.

55. Moriarty K, Cassidy P, Dalton D, et al. Alcohol-related disease: meeting the challenge of improved quality of care and better use of resources. http://www alcohollearningcentre org uk/Topics/Browse/AHW/?parent=6057&child=6382 2013 (accessed Dec 1, 2016).

56. Tsochatzis EA, Bosch J, Burroughs AK. New therapeutic paradigm for patients with cirrhosis. Hepatology 2012; 56: 1983–92.

57. Zein CO. Clearing the smoke in chronic liver diseases. Hepatology 2010; 51: 1487–90.

58. Hézode C, Roudot-Thoraval F, Nguyen S, et al. Daily cannabis smoking as a risk factor for progression of fi brosis in chronic hepatitis C. Hepatology 2005; 42: 63–71.

59. Leithead JA, Ferguson JW, Hayes PC. Smoking-related morbidity and mortality following liver transplantation. Liver Transpl 2008; 14: 1159–64.

60. Freedman ND, Park Y, Abnet CC, Hollenbeck AR, Sinha R. Association of coffee drinking with total and cause-specific mortality. N Engl J Med 2012; 366: 1891–904.

61. Torres DM, Harrison SA. Is it time to write a prescription for coffee? Coffee and liver disease. Gastroenterology 2013; 144: 670–72.

62. Larsson SC, Wolk A. Coff ee consumption and risk of liver cancer: a meta-analysis. Gastroenterology 2007; 132: 1740–45.

63. De Gottardi A, Berzigotti A, Seijo S, et al. Postprandial eff ects of dark chocolate on portal hypertension in patients with cirrhosis: results of a phase 2, double-blind, randomized controlled trial. Am J Clin Nutr 2012; 96: 584–90.

64. Hernández-Guerra M, García-Pagán JC, Turnes J, et al. Ascorbic acid improves the intrahepatic endothelial dysfunction of patients with cirrhosis and portal hypertension. Hepatology 2006; 43: 485–91.

65. Lewis JH, Stine JG. Review article: prescribing medications in patients with cirrhosis—a practical guide. Aliment Pharmacol Ther 2013; 37: 1132–56.

66. European Association For The Study Of The Liver. EASL clinical practice guidelines: management of chronic hepatitis B virus infection. J Hepatol 2012; 57: 167–85.

67. Manolakopoulos S, Triantos C, Theodoropoulos J, et al. Antiviral therapy reduces portal pressure in patients with cirrhosis due to HBeAg-negative chronic hepatitis B and signifi cant portal hypertension. J Hepatol 2009; 51: 468–74.

68. Liaw YF, Sung JJ, Chow WC, et al, and the Cirrhosis Asian Lamivudine Multicentre Study Group. Lamivudine for patients with chronic hepatitis B and advanced liver disease. N Engl J Med 2004; 351: 1521–31.

69. Everson GT, Terrault NA, Lok AS, et al, and the Adult-to-Adult Living Donor Liver Transplantation Cohort Study. A randomized controlled trial of pretransplant antiviral therapy to prevent recurrence of hepatitis C after liver transplantation. Hepatology 2013; 57: 1752–62.

70. McHutchison JG, Everson GT, Gordon SC, et al, and the PROVE1 Study Team. Telaprevir with peginterferon and ribavirin for chronic HCV genotype 1 infection. N Engl J Med 2009; 360: 1827–38.

71. Poordad F, McCone J Jr, Bacon BR, et al, and the SPRINT-2 Investigators. Boceprevir for untreated chronic HCV genotype 1 infection. N Engl J Med 2011; 364: 1195–206.

72. Charlton MR, Pockros PJ, Harrison SA. Impact of obesity on treatment of chronic hepatitis C. Hepatology 2006; 43: 1177–86.

73. Cholongitas E, Theocharidou E, Goulis J, Tsochatzis E, Akriviadis E, Burroughs K. Review article: the extra-skeletal eff ects of vitamin D in chronic hepatitis C infection. Aliment Pharmacol Ther 2012; 35: 634–46.

74. Rao GA, Pandya PK. Statin therapy improves sustained virologic response among diabetic patients with chronic hepatitis C. Gastroenterology 2011; 140: 144–52.

75. Freedman ND, Curto TM, Lindsay KL, Wright EC, Sinha R, Everhart JE, and the HALT-C TRIAL GROUP. Coffee consumption is associated with response to peginterferon and ribavirin therapy in patients with chronic hepatitis C. Gastroenterology 2011; 140: 1961–69.

76. Papatheodoridis GV, Manolakopoulos S, Touloumi G, et al, and the HEPNET. Greece Cohort Study Group. Virological suppression does not prevent the development of hepatocellular carcinoma in HBeAg-negative chronic hepatitis B patients with cirrhosis receiving oral antiviral(s) starting with lamivudine monotherapy: results of the nationwide HEPNET. Greece cohort study. Gut 2011; 60: 1109–16.

77. Burroughs AK, Thalheimer U. Hepatic venous pressure gradient in 2010: optimal measurement is key. Hepatology 2010; 51: 1894–96.

78. Groszmann RJ, Garcia-Tsao G, Bosch J, et al, and the Portal Hypertension Collaborative Group. Beta-blockers to prevent gastroesophageal varices in patients with cirrhosis. N Engl J Med 2005; 353: 2254–61.

79. Ripoll C, Groszmann R, Garcia-Tsao G, et al, and the Portal Hypertension Collaborative Group. Hepatic venous pressure gradient predicts clinical decompensation in patients with compensated cirrhosis. Gastroenterology 2007; 133: 481–88.

80. Ripoll C, Groszmann RJ, Garcia-Tsao G, et al, and the Portal Hypertension Collaborative Group. Hepatic venous pressure gradient predicts development of hepatocellular carcinoma independently of severity of cirrhosis. J Hepatol 2009; 50: 923–28.

81. de Franchis R, and the Baveno V Faculty. Revising consensus in portal hypertension: report of the Baveno V consensus workshop on methodology of diagnosis and therapy in portal hypertension. J Hepatol 2010; 53: 762–68.

82. Merli M, Nicolini G, Angeloni S, et al. Incidence and natural history of small esophageal varices in cirrhotic patients. J Hepatol 2003; 38: 266–72.

83. Garcia-Tsao G, Bosch J. Management of varices and variceal hemorrhage in cirrhosis. N Engl J Med 2010; 362: 823–32.

84. Gluud LL, Klingenberg S, Nikolova D, Gluud C. Banding ligation versus beta-blockers as primary prophylaxis in esophageal varices: systematic review of randomized trials. Am J Gastroenterol 2007; 102: 2842–48.

85. Poynard T, Calès P, Pasta L, et al, and the Franco-Italian Multicenter Study Group. Beta-adrenergic-antagonist drugs in the prevention of gastrointestinal

bleeding in patients with cirrhosis and esophageal varices. An analysis of data and prognostic factors in 589 patients from four randomized clinical trials. N Engl J Med 1991; 324: 1532–38.

86. Bosch J, Masti R, Kravetz D, et al. Eff ects of propranolol on azygos venous blood flow and hepatic and systemic hemodynamics in cirrhosis. Hepatology 1984; 4: 1200–05.
87. Andreu V, Perello A, Moitinho E, et al. Total eff ective vascular compliance in patients with cirrhosis. Effects of propranolol. J Hepatol 2002; 36: 356–61.
88. Bosch J. Carvedilol for portal hypertension in patients with cirrhosis. Hepatology 2010; 51: 2214–18.
89. Tripathi D, Ferguson JW, Kochar N, et al. Randomized controlled trial of carvedilol versus variceal band ligation for the prevention of the fi rst variceal bleed. Hepatology 2009; 50: 825–33.
90. Abraldes JG, Tarantino I, Turnes J, Garcia-Pagan JC, Rodés J, Bosch J. Hemodynamic response to pharmacological treatment of portal hypertension and long-term prognosis of cirrhosis. Hepatology 2003; 37: 902–08.
91. Villanueva C, Aracil C, Colomo A, et al. Acute hemodynamic response to beta-blockers and prediction of long-term outcome in primary prophylaxis of variceal bleeding. Gastroenterology 2009; 137: 119–28.
92. La Mura V, Abraldes JG, Raff a S, et al. Prognostic value of acute hemodynamic response to i.v. propranolol in patients with cirrhosis and portal hypertension. J Hepatol 2009; 51: 279–87.
93. Tandon P, Saez R, Berzigotti A, Abraldes JG, Garcia-Pagan JC, Bosch J. A specialized, nurse-run titration clinic: a feasible option for optimizing beta-

blockade in non-clinical trial patients. Am J Gastroenterol 2010; 105: 1917–21.

94. Burroughs AK, Tsochatzis EA, Triantos C. Primary prevention of variceal haemorrhage: a pharmacological approach. J Hepatol 2010; 52: 946–48.
95. Abraldes JG, Albillos A, Bañares R, et al. Simvastatin lowers portal pressure in patients with cirrhosis and portal hypertension: a randomized controlled trial. Gastroenterology 2009; 136: 1651–58.
96. El-Serag HB, Johnson ML, Hachem C, Morgana RO. Statins are associated with a reduced risk of hepatocellular carcinoma in a large cohort of patients with diabetes. Gastroenterology 2009; 136: 1601–08.
97. Lewis JH, Mortensen ME, Zweig S, Fusco MJ, Medoff JR, Belder R, and the Pravastatin in Chronic Liver Disease Study Investigators. Effi cacy and safety of high-dose pravastatin in hypercholesterolemic patients with well-compensated chronic liver disease: results of a prospective, randomized, double-blind, placebo-controlled, multicenter trial. Hepatology 2007; 46: 1453–63.
98. Bañares R, Albillos A, Rincón D, et al. Endoscopic treatment versus endoscopic plus pharmacologic treatment for acute variceal bleeding: a meta-analysis. Hepatology 2002; 35: 609–15.
99. Goulis J, Patch D, Burroughs AK. Bacterial infection in the pathogenesis of variceal bleeding. Lancet 1999; 353: 139–42.
100. Hou MC, Lin HC, Liu TT, et al. Antibiotic prophylaxis after endoscopic therapy prevents rebleeding in acute variceal hemorrhage: a randomized trial. Hepatology 2004; 39: 746–53.

101. Villanueva C, Colomo A, Bosch A, et al. Transfusion strategies for acute upper gastrointestinal bleeding. N Engl J Med 2013; 368: 11–21.

102. García-Pagán JC, Caca K, Bureau C, et al, and the Early TIPS (Transjugular Intrahepatic Portosystemic Shunt) Cooperative Study Group. Early use of TIPS in patients with cirrhosis and variceal bleeding. N Engl J Med 2010; 362: 2370–79.

103. Gonzalez R, Zamora J, Gomez-Camarero J, Molinero LM, Bañares R, Albillos A. Meta-analysis: combination endoscopic and drug therapy to prevent variceal rebleeding in cirrhosis. Ann Intern Med 2008; 149: 109–22.

104. Wiest R, Groszmann RJ. The paradox of nitric oxide in cirrhosis and portal hypertension: too much, not enough. Hepatology 2002; 35: 478–91.

105. Runyon BA, and the AASLD Practice Guidelines Committee. Management of adult patients with ascites due to cirrhosis: an update. Hepatology 2009; 49: 2087–107.

106. Hernández-Gea V, Aracil C, Colomo A, et al. Development of ascites in compensated cirrhosis with severe portal hypertension treated with β-blockers. Am J Gastroenterol 2012; 107: 418–27.

107. Borzio M, Salerno F, Piantoni L, et al. Bacterial infection in patients with advanced cirrhosis: a multicentre prospective study. Dig Liver Dis 2001; 33: 41–48.

108. Angeli P, Fasolato S, Mazza E, et al. Combined versus sequential diuretic treatment of ascites in non-azotaemic patients with cirrhosis: results of an open randomised clinical trial. Gut 2010; 59: 98–104.

109. European Association for the Study of the Liver. EASL clinical practice guidelines on the management of ascites, spontaneous bacterial peritonitis, and hepatorenal syndrome in cirrhosis. J Hepatol 2010; 53: 397–417.

110. Singh V, Dhungana SP, Singh B, et al. Midodrine in patients with cirrhosis and refractory or recurrent ascites: a randomized pilot study. J Hepatol 2012; 56: 348–54.

111. Ginès P, Titó L, Arroyo V, et al. Randomized comparative study of therapeutic paracentesis with and without intravenous albumin in cirrhosis. Gastroenterology 1988; 94: 1493–502.

112. Salerno F, Cammà C, Enea M, Rössle M, Wong F. Transjugular intrahepatic portosystemic shunt for refractory ascites: a meta-analysis of individual patient data. Gastroenterology 2007; 133: 825–34.

113. Bureau C, Métivier S, D'Amico M, et al. Serum bilirubin and platelet count: a simple predictive model for survival in patients with refractory ascites treated by TIPS. J Hepatol 2011; 54: 901–07.

114. Tandon P, Abraldes JG, Berzigotti A, Garcia-Pagan JC, Bosch J. Renin-angiotensin-aldosterone inhibitors in the reduction of portal pressure: a systematic review and meta-analysis. J Hepatol 2010; 53: 273–82.

115. Vlachogiannakos J, Tang AK, Patch D, Burroughs AK. Angiotensin converting enzyme inhibitors and angiotensin II antagonists as therapy in chronic liver disease. Gut 2001; 49: 303–08.

116. Sersté T, Melot C, Francoz C, et al. Deleterious eff ects of beta-blockers on survival in patients with cirrhosis and refractory ascites. Hepatology 2010; 52: 1017–22.

117. Senzolo M, Nadal E, Cholongitas E, Burroughs AK. Is hydrophobia necessary for the hepatologist prescribing nonselective beta-blockers in cirrhosis? Hepatology 2011; 53: 2149–50.

118. Fernández J, Navasa M, Gómez J, et al. Bacterial infections in cirrhosis: epidemiological changes with invasive procedures and norfl oxacin prophylaxis. Hepatology 2002; 35: 140–48.

119. Thalheimer U, Triantos CK, Samonakis DN, Patch D, Burroughs AK. Infection, coagulation, and variceal bleeding in cirrhosis. Gut 2005; 54: 556–63.

120. Albillos A, de la Hera A, González M, et al. Increased lipopolysaccharide binding protein in cirrhotic patients with marked immune and hemodynamic derangement. Hepatology 2003; 37: 208–17.

121. Nischalke HD, Berger C, Aldenhoff K, et al. Toll-like receptor (TLR) 2 promoter and intron 2 polymorphisms are associated with increased risk for spontaneous bacterial peritonitis in liver cirrhosis. J Hepatol 2011; 55: 1010–16.

122. Bellot P, García-Pagán JC, Francés R, et al. Bacterial DNA translocation is associated with systemic circulatory abnormalities and intrahepatic endothelial dysfunction in patients with cirrhosis. Hepatology 2010; 52: 2044–52.

123. Zapater P, Francés R, González-Navajas JM, et al. Serum and ascitic fl uid bacterial DNA: a new independent prognostic factor in noninfected patients with cirrhosis. Hepatology 2008; 48: 1924–31.

124. Tritto G, Bechlis Z, Stadlbauer V, et al. Evidence of neutrophil functional defect despite infl ammation in stable cirrhosis. J Hepatol 2011; 55: 574–81.

125. Coant N, Simon-Rudler M, Gustot T, et al. Glycogen synthase kinase 3 involvement in the excessive proinfl ammatory response to LPS in patients with decompensated cirrhosis. J Hepatol 2011; 55: 784–93.

126. Senzolo M, Cholongitas E, Burra P, et al. β-blockers protect against spontaneous bacterial peritonitis in cirrhotic patients: a meta-analysis. Liver Int 2009; 29: 1189–93.

127. Reiberger T, Ferlitsch A, Payer BA, et al, and the Vienna Hepatic Hemodynamic Lab. Non-selective betablocker therapy decreases intestinal permeability and serum levels of LBP and IL-6 in patients with cirrhosis. J Hepatol 2013; 58: 911–21.

128. Worlicek M, Knebel K, Linde HJ, et al. Splanchnic sympathectomy prevents translocation and spreading of E coli but not S aureus in liver cirrhosis. Gut 2010; 59: 1127–34.

129. Rasaratnam B, Kaye D, Jennings G, Dudley F, Chin-Dusting J. The eff ect of selective intestinal decontamination on the hyperdynamic circulatory state in cirrhosis: a randomized trial. Ann Intern Med 2003; 139: 186–93.

130. Fernández J, Navasa M, Planas R, et al. Primary prophylaxis of spontaneous bacterial peritonitis delays hepatorenal syndrome and improves survival in cirrhosis. Gastroenterology 2007; 133: 818–24.

131. Runyon BA, McHutchison JG, Antillon MR, Akriviadis EA, Montano AA. Short-course versus long-course antibiotic treatment of spontaneous bacterial peritonitis: a randomized controlled study of 100 patients. Gastroenterology 1991; 100: 1737–42.

132. Sort P, Navasa M, Arroyo V, et al. Eff ect of intravenous albumin on renal impairment and mortality in patients with cirrhosis and spontaneous bacterial peritonitis. N Engl J Med 1999; 341: 403–09.

133. Sigal SH, Stanca CM, Fernandez J, Arroyo V, Navasa M. Restricted use of albumin for spontaneous bacterial peritonitis. Gut 2007; 56: 597–99.

134. Guevara M, Terra C, Nazar A, et al. Albumin for bacterial infections other than spontaneous bacterial peritonitis in cirrhosis: a randomized, controlled study. J Hepatol 2012; 57: 759–65.

135. Bajaj JS, Zadvornova Y, Heuman DM, et al. Association of proton pump inhibitor therapy with spontaneous bacterial peritonitis in cirrhotic patients with ascites. Am J Gastroenterol 2009; 104: 1130–34.

136. Bajaj JS, Ananthakrishnan AN, Hafeezullah M, et al. Clostridium diffi cile is associated with poor outcomes in patients with cirrhosis: A national and tertiary center perspective. Am J Gastroenterol 2010; 105: 106–13.

137. Jepsen P, Ott P, Andersen PK, Sørensen HT, Vilstrup H. Clinical course of alcoholic liver cirrhosis: a Danish population-based cohort study. Hepatology 2010; 51: 1675–82.

138. Laleman W, Simon-Talero M, Maleux G, et al, and the EASL-CLIF-Consortium. Embolization of large spontaneous portosystemic shunts for refractory hepatic encephalopathy: a multicenter survey on safety and effi cacy. Hepatology 2013; 57: 2448–57.

139. Bai M, Yang Z, Qi X, Fan D, Han G. l-ornithine-l-aspartate for hepatic encephalopathy in patients with cirrhosis: a meta-analysis of randomized controlled trials. J Gastroenterol Hepatol 2013; 28: 783–92.

140. Bass NM, Mullen KD, Sanyal A, et al. Rifaximin treatment in hepatic encephalopathy. N Engl J Med 2010; 362: 1071–81.

141. Vilstrup H., Amodio P., Bajaj J., Cordoba J., Ferenci P., Mullen K.D., Weissenborn K., Wong P. Hepatic encephalopathy in chronic liver disease: 2014 Practice Guideline by the American Association for the Study of Liver Diseases and the European Association for the Study of the Liver. Hepatology. 2014;60:715–735. doi: 10.1002/hep.27210.

142. Montagnese S., Russo F.P., Amodio P., Burra P., Gasbarrini A., Loguercio C., Marchesini G., Merli M., Ponziani F.R., Riggio O., et al. Hepatic encephalopathy 2018: A clinical practice guideline by the Italian Association for the Study of the Liver (AISF) Dig. Liver Dis. 2019;51:190–205. doi: 10.1016/j.dld.2018.11.035.

143. European Association for the Study of the Liver EASL Clinical Practice Guidelines on the management of hepatic encephalopathy. J. Hepatol. 2022;77:807–824. doi: 10.1016/j.jhep.2022.06.001.

144. Elsaid M.I., Rustgi V.K. Epidemiology of Hepatic Encephalopathy. Clin. Liver Dis. 2020;24:157–174. doi: 10.1016/j.cld.2020.01.001.

145. Poordad F.F. Review article: The burden of hepatic encephalopathy. Aliment. PharmacolTher. 2007;25((Suppl. S1)):3–9. doi: 10.1111/j.1746-6342.2006.03215.x.

146. Ridola L., Cardinale V., Riggio O. The burden of minimal hepatic encephalopathy: From diagnosis to therapeutic strategies. Ann. Gastroenterol. 2018;31:151–164. doi: 10.20524/aog.2018.0232.

147. Riggio O., Merlli M., Pedretti G., Servi R., Meddi P., Lionetti R., Rossi P., Bezzi M., Salvatori F., Ugolotti U., et al. Hepatic encephalopathy after

transjugular intrahepatic portosystemic shunt. Incidence and risk factors. Dig. Dis. Sci. 1996;41:578–584. doi: 10.1007/BF02282344.

148. Rose C.F., Amodio P., Bajaj J.S., Dhiman R.K., Montagnese S., Taylor-Robinson S.D., Vilstrup H., Jalan R. Hepatic encephalopathy: Novel insights into classification, pathophysiology and therapy. J. Hepatol. 2020;73:1526–1547. doi: 10.1016/j.jhep.2020.07.013.
149. Levitt D.G., Levitt M.D. A model of blood-ammonia homeostasis based on a quantitative analysis of nitrogen metabolism in the multiple organs involved in the production, catabolism, and excretion of ammonia in humans. Clin. Exp. Gastroenterol. 2018;11:193–215. doi: 10.2147/CEG.S160921.
150. Wright G., Noiret L., Olde Damink S.W., Jalan R. Interorgan ammonia metabolism in liver failure: The basis of current and future therapies. Liver Int. 2011;31:163–175. doi: 10.1111/j.1478-3231.2010.02302.x.
151. Bosoi C.R., Rose C.F. Identifying the direct effects of ammonia on the brain. Metab. Brain Dis. 2009;24:95–102. doi: 10.1007/s11011-008-9112-7.
152. Shawcross D.L., Sharifi Y., Canavan J.B., Yeoman A.D., Abeles R.D., Taylor N.J., Auzinger G., Bernal W., Wendon J.A. Infection and systemic inflammation, not ammonia, are associated with Grade 3/4 hepatic encephalopathy, but not mortality in cirrhosis. J. Hepatol. 2011;54:640–649. doi: 10.1016/j.jhep.2010.07.045.
153. Dhiman R.K. Gut microbiota, inflammation and hepatic encephalopathy: A puzzlewith a solution in sight. J. Clin. Exp. Hepatol. 2012;2:207–210. doi: 10.1016/j.jceh.2012.08.004.

154. Seyan A.S., Hughes R.D., Shawcross D.L. Changing face of hepatic encephalopathy: Role of inflammation and oxidative stress. World J. Gastroenterol. 2010;16:3347–3357. doi: 10.3748/wjg.v16.i27.3347.

155. Bajaj J.S., Ridlon J.M., Hylemon P.B., Thacker L.R., Heuman D.M., Smith S., Sikaroodi M., Gillevet P.M. Linkage of gut microbiome with cognition in hepatic encephalopathy. Am. J. Physiol. Gastrointest. Liver Physiol. 2012;302:G168–G175. doi: 10.1152/ajpgi.00190.2011.

156. Hakansson A., Molin G. Gut microbiota and inflammation. Nutrients. 2011;3:637–682. doi: 10.3390/nu3060637.

157. Hassouneh R., Bajaj J.S. Gut Microbiota Modulation and Fecal Transplantation: An Overview on Innovative Strategies for Hepatic Encephalopathy Treatment. J. Clin. Med. 2021;10:330. doi: 10.3390/jcm10020330.

158. Leber B., Spindelboeck W., Stadlbauer V. Infectious complications of acute and chronic liver disease. Semin. Respir. Crit. Care Med. 2012;33:80–95. doi: 10.1055/s-0032-1301737.

159. Jalan R., Fernandez J., Wiest R., Schnabl B., Moreau R., Angeli P., Stadlbauer V., Gustot T., Bernardi M., Canton R., et al. Bacterial infections in cirrhosis: A position statement based on the EASL Special Conference 2013. J. Hepatol. 2014;60:1310–1324. doi: 10.1016/j.jhep.2014.01.024.

160. Piano S., Tonon M., Angeli P. Changes in the epidemiology and management of bacterial infections in cirrhosis. Clin. Mol. Hepatol. 2021;27:437–445. doi: 10.3350/cmh.2020.0329.

161. Albillos A., Lario M., Álvarez-Mon M. Cirrhosis-associated immune dysfunction: Distinctive features and clinical relevance. J. Hepatol. 2014;61:1385–1396. doi: 10.1016/j.jhep.2014.08.010.

162. Wiest R., Lawson M., Geuking M. Pathological bacterial translocation in liver cirrhosis. J. Hepatol. 2014;60:197–209. doi: 10.1016/j.jhep.2013.07.044.

163. Bajaj J.S., Heuman D.M., Hylemon P.B., Sanyal A.J., White M.B., Monteith P., Noble N.A., Unser A.B., Daita K., Fisher A.R., et al. Altered profile of human gut microbiome is associated with cirrhosis and its complications. J. Hepatol. 2014;60:940–947. doi: 10.1016/j.jhep.2013.12.019.

164. Fernández J., Prado V., Trebicka J., Amoros A., Gustot T., Wiest R., Deulofeu C., Garcia E., Acevedo J., Fuhrmann V., et al. European Foundation for the Study of Chronic Liver Failure (EF-Clif). Multidrug-resistant bacterial infections in patients with decompensated cirrhosis and with acute-on-chronic liver failure in Europe. J. Hepatol. 2019;70:398–411. doi: 10.1016/j.jhep.2018.10.027.

165. Piano S., Singh V., Caraceni P., Maiwall R., Alessandria C., Fernandez J., Soares E.C., Kim D.J., Kim S.E., Marino M., et al. International Club of Ascites Global Study Group. Epidemiology and Effects of Bacterial Infections in Patients With Cirrhosis
Worldwide. Gastroenterology. 2019;156:1368–1380.e10.
doi: 10.1053/j.gastro.2018.12.005.

166. Fernández J., Acevedo J., Castro M., Garcia O., de Lope C.R., Roca D., Pavesi M., Sola E., Moreira L., Silva A., et al. Prevalence and risk factors of

infections by multiresistantbacteria in cirrhosis: A prospective study. Hepatology. 2012;55:1551–1561. doi: 10.1002/hep.25532.

167. Merli M., Lucidi C., Giannelli V., Giusto M., Riggio O., Falcone M., Ridola L., Attili A.F., Venditti M. Cirrhoticpatients are at risk for health care-associated bacterial infections. Clin. Gastroenterol. Hepatol. 2010;8:979–985. doi: 10.1016/j.cgh.2010.06.024.
168. Merli M., Lucidi C., Pentassuglio I., Giannelli V., Giusto M., Di Gregorio V., Pasquale C., Nardelli S., Lattanzi B., Venditti M., et al. Increased risk of cognitive impairment in cirrhoticpatients with bacterialinfections. J. Hepatol. 2013;59:243–250. doi: 10.1016/j.jhep.2013.03.012.
169. Medzhitov R., Schneider D.S., Soares M.P. Disease tolerance as a defense strategy. Science. 2012;335:936–941. doi: 10.1126/science.1214935.
170. Alabsawy E., Shalimar Sheikh M.F., Ballester M.P., Acharya S.K., Agarwal B., Jalan R. Overt hepatic encephalopathy is an independent risk factor for de novo infection in cirrhotic patients with acute decompensation. Aliment. Pharmacol. Ther. 2022;55:722–732. doi: 10.1111/apt.16790.
171. Riggio O., Ridola L. Editorial: Infections and hepatic encephalopathy-does the chicken or the egg come FIRST? A novel perspective at the horizon. Aliment. Pharmacol. Ther. 2022;55:744–745. doi: 10.1111/apt.16809.
172. Riggio O., Nardelli S., Gioia S., Lucidi C., Merli M. Management of hepatic encephalopathy as an inpatient. Clin. Liver Dis. 2015;5:79–82. doi: 10.1002/cld.457.

173. European Association for the Study of the Liver EASL Clinical Practice Guidelines for the management of patients with decompensated cirrhosis. J. Hepatol. 2018;69:406–460. doi: 10.1016/j.jhep.2018.03.024.

174. Rattanasupar A., Tiawijit N., Rachatapantanakorn B. Predictive factor for hepatic encephalopathy in cirrhotic patients who presented with acute variceal bleeding. J. Med. Assoc. Thai. 2014;97:567–573.

175. Sharma P., Agrawal A., Sharma B.C., Sarin S.K. Prophylaxis of hepatic encephalopathy in acute variceal bleed: A randomized controlled trial of lactulose versus no lactulose. J. Gastroenterol. Hepatol. 2011;26:996–1003. doi: 10.1111/j.1440-1746.2010.06596.x.

176. Wen J., Liu Q., Song J., Tong M., Peng L., Liang H. Lactulose is highly potential in prophylaxis of hepatic encephalopathy in patients with cirrhosis and upper gastrointestinal bleeding: Results of a controlled randomized trial. Digestion. 2013;87:132–138. doi: 10.1159/000346083.

177. de-la-Tijera H.F., Servín-Caamaño A.I., Salas-Gordillo F., Pérez-Hernández J.L., Abdo-Francis J.M., Camacho-Aguilera J., Alla S.N., Jiménez-Ponce F. PrimaryProphylaxis to Prevent the Development of Hepatic Encephalopathy in Cirrhotic Patients with Acute Variceal Bleeding. Can. J. Gastroenterol. Hepatol. 2018;2018:3015891. doi: 10.1155/2018/3015891.

178. Rattanasupar A., Chang A., Akarapatima K., Chaojin T., Piratvisuth T. Role of lactulose for prophylaxis against hepatic encephalopathy in cirrhotic patients with upper gastrointestinal bleeding: A randomized trial. Indian J. Gastroenterol. 2021;40:621–629. doi: 10.1007/s12664-021-01150-2.

179. de Franchis R., Bosch J., Garcia-Tsao G., Reiberger T., Ripoll C. Baveno VII Faculty. Baveno VII—Renewing consensus in portal hypertension. J. Hepatol. 2022;76:959–974. doi: 10.1016/j.jhep.2021.12.022.

180. Tripathi D., Stanley A.J., Hayes P.C., Travis S., Armstrong M.J., Tsochatzis E.A., Rowe I.A., Roslund N., Ireland H., Lomax M., et al. Transjugular intrahepatic portosystemic stent-shunt in the management of portal hypertension. Gut. 2020;69:1173–1192. doi: 10.1136/gutjnl-2019-320221.

181. Zuckerman M.J., Elhanafi S., Mendoza Ladd A. Endoscopic Treatment of Esophageal Varices. Clin. Liver Dis. 2022;26:21–37. doi: 10.1016/j.cld.2021.08.003.

182. Pantham G., Post A., Venkat D., Einstadter D., Mullen K.D. A New Look at Precipitants of Overt Hepatic Encephalopathy in Cirrhosis. Dig. Dis. Sci. 2017;62:2166–2173. doi: 10.1007/s10620-017-4630-y.

183. Liu T.L., Trogdon J., Weinberger M., Fried B., Barritt A.S., IV Diabetes Is Associated with Clinical Decompensation Events in Patients with Cirrhosis. Dig. Dis. Sci. 2016;61:3335–3345. doi: 10.1007/s10620-016-4261-8.

184. Bajaj J.S., Sanyal A.J., Bell D., Gilles H., Heuman D.M. Predictors of the recurrence of hepatic encephalopathy in lactulose-treated patients. Aliment. Pharmacol. Ther. 2010;31:1012–1017. doi: 10.1111/j.1365-2036.2010.04257.x.

185. Praharaj D.L., Anand A.C. Clinical Implications, Evaluation, and Management of Hyponatremia in Cirrhosis. J. Clin. Exp. Hepatol. 2022;12:575–594. doi: 10.1016/j.jceh.2021.09.008.

186. Jenq C.C., Tsai M.H., Tian Y.C., Chang M.Y., Lin C.Y., Lien J.M., Chen Y.C., Fang J.T., Chen P.C., Yang C.W. Serum sodium predicts prognosis in critically ill cirrhotic patients. J. Clin. Gastroenterol. 2010;44:220–226. doi: 10.1097/MCG.0b013e3181aabbcd.

187. Restuccia T., Gómez-Ansón B., Guevara M., Alessandria C., Torre A., Alayrach M.E., Terra C., Martín M., Castellví M., Rami L., et al. Effects of dilutional hyponatremia on brain organic osmolytes and water content in patients with cirrhosis. Hepatology. 2004;39:1613–1622. doi: 10.1002/hep.20237.

188. Guevara M., Baccaro M.E., Torre A., Gómez-Ansón B., Ríos J., Torres F., Rami L., Monté-Rubio G.C., Martín-Llahí M., Arroyo V., et al. Hyponatremia is a risk factor of hepatic encephalopathy in patients with cirrhosis: A prospective study with time-dependent analysis. Am. J. Gastroenterol. 2009;104:1382–1389. doi: 10.1038/ajg.2009.293.

189. Guevara M., Baccaro M.E., Ríos J., Martín-Llahí M., Uriz J., Ruiz del Arbol L., Planas R., Monescillo A., Guarner C., Crespo J., et al. Risk factors for hepatic encephalopathy in patients with cirrhosis and refractory ascites: Relevance of serum sodium concentration. Liver Int. 2010;30:1137–1142. doi: 10.1111/j.1478-3231.2010.02293.x.

190. Watson H., Guevara M., Vilstrup H., Ginès P. Improvement of hyponatremia in cirrhosis is associated with improved complex information processing. J. Gastroenterol. Hepatol. 2019;34:1999–2003. doi: 10.1111/jgh.14683.

191. Bossen L., Ginès P., Vilstrup H., Watson H., Jepsen P. Serum sodium as a risk factor for hepatic encephalopathy in patients with cirrhosis and ascites. J. Gastroenterol. Hepatol. 2019;34:914–920. doi: 10.1111/jgh.14558.

192. Abou-Assi S., Vlahcevic Z.R. Hepatic encephalopathy. Metabolic consequence of cirrhosis often is reversible. Postgrad. Med. 2001;109:52–54, 57–60, 63–65 passim. doi: 10.3810/pgm.2001.02.850.

193. Poudyal N.S., Chaudhary S., Kc S., Paudel B.N., Basnet B.K., Mandal A., Kafle P., Chaulagai B., Mojahedi A., Paudel M.S., et al. Precipitating Factors and Treatment Outcomes of Hepatic Encephalopathy in Liver Cirrhosis. Cureus. 2019;11:e4363. doi: 10.7759/cureus.4363.

194. Bouin M., Vincent C., Bouhier K., Debruyne D., Fatome A., Piquet M.A., Verwaerde J.C., Dao T. Increased oro-cecal transit time in grade I or II hepatic encephalopathy. Gastroenterol. Clin. Biol. 2004;28:1240–1244. doi: 10.1016/S0399-8320(04)95217-7.

195. Grønbæk L., Watson H., Vilstrup H., Jepsen P. Benzodiazepines and risk for hepatic encephalopathy in patients with cirrhosis and ascites. United Eur. Gastroenterol. J. 2018;6:407–412. doi: 10.1177/2050640617727179.

196. Di Cola S., Nardelli S., Ridola L., Gioia S., Riggio O., Merli M. Ammonia and the Muscle: An Emerging Point of View on Hepatic Encephalopathy. J. Clin. Med. 2022;11:611. doi: 10.3390/jcm11030611.

197. Bhanji R.A., Moctezuma-Velazquez C., Duarte-Rojo A., Ebadi M., Ghosh S., Rose C., Montano-Loza A.J. Myosteatosis and sarcopenia are associated with hepatic encephalopathy in patients with cirrhosis. Hepatol. Int. 2018;12:377–386. doi: 10.1007/s12072-018-9875-9.

198. Montano-Loza A.J., Meza-Junco J., Prado C.M., Lieffers J.R., Baracos V.E., Bain V.G., Sawyer M.B. Muscle wasting is associated with mortality in patients with cirrhosis. Clin. Gastroenterol. Hepatol. 2012;10:166–173.e1. doi: 10.1016/j.cgh.2011.08.028.

199. Montano-Loza A.J., Angulo P., Meza-Junco J., Prado C.M., Sawyer M.B., Beaumont C., Esfandiari N., Ma M., Baracos V.E. Sarcopenic obesity and myosteatosis are associated with higher mortality in patients with cirrhosis. J. Cachexia Sarcopenia Muscle. 2016;7:126–135. doi: 10.1002/jcsm.12039.

200. Lattanzi B., Nardelli S., Pigliacelli A., Di Cola S., Farcomeni A., D'Ambrosio D., Gioia S., Ginanni Corradini S., Lucidi C., Mennini G., et al. The additive value of sarcopenia, myosteatosis and hepatic encephalopathy in the predictivity of model for end-stage liver disease. Dig. Liver Dis. 2019;51:1508–1512. doi: 10.1016/j.dld.2019.09.004.

201. Nardelli S., Lattanzi B., Merli M., Farcomeni A., Gioia S., Ridola L., Riggio O. Muscle Alterations Are Associated With Minimal and Overt Hepatic Encephalopathy in Patients With Liver Cirrhosis. Hepatology. 2019;70:1704–1713. doi: 10.1002/hep.30692.

202. Merli M., Giusto M., Lucidi C., Giannelli V., Pentassuglio I., Di Gregorio V., Lattanzi B., Riggio O. Muscle depletion increases the risk of overt and minimal hepatic encephalopathy: Results of a prospective study. Metab. Brain Dis. 2013;28:281–284. doi: 10.1007/s11011-012-9365-z.

203. Ridola L., Gioia S., Faccioli J., Riggio O., Nardelli S. Gut liver muscle brain axis: A comprehensive viewpoint on prognosis in cirrhosis. J. Hepatol. 2022;77:262–263. doi: 10.1016/j.jhep.2022.01.003.

204. Romeiro F.G., Augusti L. Nutritional assessment in cirrhotic patients with hepatic encephalopathy. World J. Hepatol. 2015;7:2940–2954. doi: 10.4254/wjh.v7.i30.2940.

205. Faccioli J., Nardelli S., Gioia S., Riggio O., Ridola L. Nutrition Assessment and Management in Patients with Cirrhosis and Cognitive Impairment: A

Comprehensive Review of Literature. J. Clin. Med. 2022;11:2842. doi: 10.3390/jcm11102842.

206. Amodio P., Bemeur C., Butterworth R., Cordoba J., Kato A., Montagnese S., Uribe M., Vilstrup H., Morgan M.Y. The nutritional management of hepatic encephalopathy in patients with cirrhosis: International Society for Hepatic Encephalopathy and Nitrogen Metabolism Consensus. Hepatology. 2013;58:325–336. doi: 10.1002/hep.26370.
207. European Association for the Study of the Liver EASL Clinical Practice Guidelines on nutrition in chronic liver disease. J. Hepatol. 2019;70:172–193. doi: 10.1016/j.jhep.2018.06.024.
208. Merli M., Riggio O. Dietary and nutritional indications in hepatic encephalopathy. Metab. Brain Dis. 2009;24:211–221. doi: 10.1007/s11011-008-9127-0.
209. Yao C.K., Fung J., Chu N.H.S., Tan V.P.Y. Dietary Interventions in Liver Cirrhosis. J. Clin. Gastroenterol. 2018;52:663–673. doi: 10.1097/MCG.0000000000001071.
210. Zenith L., Meena N., Ramadi A., Yavari M., Harvey A., Carbonneau M., Ma M., Abraldes J.G., Paterson I., Haykowsky M.J., et al. Eight weeks of exercise training increases aerobic capacity and muscle mass and reduces fatigue in patients with cirrhosis. Clin. Gastroenterol. Hepatol. 2014;12:1920–1926.e2. doi: 10.1016/j.cgh.2014.04.016.
211. Ohnishi K., Sato S., Saito M., Terabayashi H., Nakayama T., Saito M., Chin N., Iida S., Nomura F., Okuda K. Clinical and portal hemodynamic features in cirrhotic patients having a large spontaneous splenorenal and/or gastrorenal shunt. Am. J. Gastroenterol. 1986;81:450–455.

212. Saad W.E. Vascular anatomy and the morphologic and hemodynamic classifications of gastric varices and spontaneous portosystemic shunts relevant to the BRTO procedure. Tech. Vasc. Interv. Radiol. 2013;16:60–100. doi: 10.1053/j.tvir.2013.02.002.

213. Nardelli S., Riggio O., Gioia S., Puzzono M., Pelle G., Ridola L. Spontaneous porto-systemic shunts in livercirrhosis: Clinical and therapeuticalaspects. World J. Gastroenterol. 2020;26:1726–1732. doi: 10.3748/wjg.v26.i15.1726.

214. Simón-Talero M., Roccarina D., Martínez J., Lampichler K., Baiges A., Low G., Llop E., Praktiknjo M., Maurer M.H., Zipprich A., et al. Baveno VI-SPSS group from the Baveno Cooperation. Association Between Portosystemic Shunts and Increased Complications and Mortality in Patients With Cirrhosis. Gastroenterology. 2018;154:1694–1705.e4. doi: 10.1053/j.gastro.2018.01.028.

215. Riggio O., Efrati C., Catalano C., Pediconi F., Mecarelli O., Accornero N., Nicolao F., Angeloni S., Masini A., Ridola L., et al. High prevalence of spontaneousportal-systemic shunts in persistenthepaticencephalopathy: A case-control study. Hepatology. 2005;42:1158–1165. doi: 10.1002/hep.20905.

216. Nardelli S., Riggio O., Turco L., Gioia S., Puzzono M., Bianchini M., Ridola L., Aprile F., Gitto S., Pelle G., et al. Relevance of SpontaneousPortosystemic Shunts Detected with CT in Patients with Cirrhosis. Radiology. 2021;299:133–140. doi: 10.1148/radiol.2021203051.

217. Praktiknjo M., Simón-Talero M., Römer J., Roccarina D., Martínez J., Lampichler K., Baiges A., Low G., Llop E., Maurer M.H., et al. Baveno VI-

SPSS group of the Baveno Cooperation. Total area of spontaneous portosystemic shunts independently predicts hepatic encephalopathy and mortality in liver cirrhosis. J. Hepatol. 2020;72:1140–1150. doi: 10.1016/j.jhep.2019.12.021.

218. An J., Kim K.W., Han S., Lee J., Lim Y.S. Improvement in survival associated with embolisation of spontaneous portosystemic shunt in patients with recurrent hepatic encephalopathy. Aliment. Pharmacol. Ther. 2014;39:1418–1426. doi: 10.1111/apt.12771.
219. Laleman W., Simon-Talero M., Maleux G., Perez M., Ameloot K., Soriano G., Villalba J., Garcia-Pagan J.C., Barrufet M., Jalan R., et al. EASL-CLIF-Consortium. Embolization of large spontaneous portosystemic shunts for refractory hepatic encephalopathy: A multicenter survey on safety and efficacy. Hepatology. 2013;57:2448–2457. doi: 10.1002/hep.26314.
220. Mukund A., Rajesh S., Arora A., Patidar Y., Jain D., Sarin S.K. Efficacy of balloon-occluded retrograde transvenous obliteration of large spontaneous lienorenal shunt in patients with severe recurrent hepatic encephalopathy with foam sclerotherapy: Initial experience. J. Vasc. Interv. Radiol. 2012;23:1200–1206. doi: 10.1016/j.jvir.2012.05.046.
221. Gwon D.I., Kim Y.H., Ko G.Y., Kim J.W., Ko H.K., Kim J.H., Shin J.H., Yoon H.K., Sung K.B. Vascular Plug-Assisted Retrograde Transvenous Obliteration for the Treatment of Gastric Varices and Hepatic Encephalopathy: A Prospective Multicenter Study. J. Vasc. Interv. Radiol. 2015;26:1589–1595. doi: 10.1016/j.jvir.2015.07.011.
222. Lee E.W., Saab S., Gomes A.S., Busuttil R., McWilliams J., Durazo F., Han S.H., Goldstein L., Tafti B.A., Moriarty J., et al. Coil-Assisted Retrograde

Transvenous Obliteration (CARTO) for the Treatment of Portal Hypertensive Variceal Bleeding: Preliminary Results. Clin. Transl. Gastroenterol. 2014;5:e61. doi: 10.1038/ctg.2014.12.

223. Riggio O., Nardelli S., Moscucci F., Pasquale C., Ridola L., Merli M. Hepaticencephalopathy after transjugularintrahepaticportosystemic shunt. Clin. Liver Dis. 2012;16:133–146. doi: 10.1016/j.cld.2011.12.008.
224. Somberg K.A., Riegler J.L., LaBerge J.M., Doherty-Simor M.M., Bachetti P., Roberts J.P., Lake J.R. Hepatic encephalopathy after transjugular intrahepatic portosystemic shunts: Incidence and risk factors. Am. J. Gastroenterol. 1995;90:549–555.
225. Nardelli S., Bellafante D., Ridola L., Faccioli J., Riggio O., Gioia S. Prevention of post-tips hepatic encephalopathy: The search of the ideal candidate. Metab. Brain Dis. 2022 doi: 10.1007/s11011-022-01131-0.
226. Bai M., Qi X.S., Yang Z.P., Yang M., Fan D.M., Han G.H. TIPS improves liver transplantation-free survival in cirrhotic patients with refractory ascites: An updated meta-analysis. World J. Gastroenterol. 2014;20:2704–2714. doi: 10.3748/wjg.v20.i10.2704.
227. Riggio O., Angeloni S., Salvatori F.M., De Santis A., Cerini F., Farcomeni A., Attili A.F., Merli M. Incidence, natural history, and risk factors of hepatic encephalopathy after transjugular intrahepatic portosystemic shunt with polytetrafluoroethylene-covered stent grafts. Am. J. Gastroenterol. 2008;103:2738–2746. doi: 10.1111/j.1572-0241.2008.02102.x.
228. Riggio O., Masini A., Efrati C., Nicolao F., Angeloni S., Salvatori F.M., Bezzi M., Attili A.F., Merli M. Pharmacological prophylaxis of hepatic

encephalopathy after transjugular intrahepatic portosystemic shunt: A randomized controlled study. J. Hepatol. 2005;42:674–679. doi: 10.1016/j.jhep.2004.12.028.

229. Bureau C., Thabut D., Jezequel C., Archambeaud I., D'Alteroche L., Dharancy S., Borentain P., Oberti F., Plessier A., De Ledinghen V., et al. The Use of Rifaximin in the Prevention of Overt Hepatic Encephalopathy After Transjugular Intrahepatic Portosystemic Shunt: A Randomized Controlled Trial. Ann. Intern. Med. 2021;174:633–640. doi: 10.7326/M20-0202.
230. Wang Q., Lv Y., Bai M., Wang Z., Liu H., He C., Niu J., Guo W., Luo B., Yin Z., et al. Eight millimetre covered TIPS does not compromise shunt function but reduces hepatic encephalopathy in preventing variceal rebleeding. J. Hepatol. 2017;67:508–516. doi: 10.1016/j.jhep.2017.05.006.
231. Mollaiyan A., Bettinger D., Rössle M. The underdilation of nitinol stents at TIPS implantation: Solution or illusion? Eur. J. Radiol. 2017;89:123–128. doi: 10.1016/j.ejrad.2017.01.032.
232. Schepis F., Vizzutti F., Garcia-Tsao G., Marzocchi G., Rega L., De Maria N., Di Maira T., Gitto S., Caporali C., Colopi S., et al. Under-dilated TIPS Associate With Efficacy and Reduced Encephalopathy in a Prospective, Non-randomized Study of Patients with Cirrhosis. Clin. Gastroenterol. Hepatol. 2018;16:1153–1162.e7. doi: 10.1016/j.cgh.2018.01.029.
233. Gioia S., Merli M., Nardelli S., Lattanzi B., Pitocchi F., Ridola L., Riggio O. The modification of quantity and quality of muscle mass improves the cognitive impairment after TIPS. Liver Int. 2019;39:871–877. doi: 10.1111/liv.14050.

234. Liu J., Ma J., Yang C., Chen M., Shi Q., Zhou C., Huang S., Chen Y., Wang Y., Li T., et al. Sarcopenia in Patients with Cirrhosis after Transjugular Intrahepatic Portosystemic Shunt Placement. Radiology. 2022;303:711–719. doi: 10.1148/radiol.211172.

235. Bass N.M., Mullen K.D., Sanyal A., Poordad F., Neff G., Leevy C.B., Sigal S., Sheikh M.Y., Beavers K., Frederick T., et al. Rifaximin treatment in hepatic encephalopathy. N. Engl. J. Med. 2010;362:1071–1081. doi: 10.1056/NEJMoa0907893.

236. Alimirah M., Sadiq O., Gordon S.C. Novel Therapies in Hepatic Encephalopathy. Clin. Liver Dis. 2020;24:303–315. doi: 10.1016/j.cld.2020.01.009.

237. Dalal R., McGee R.G., Riordan S.M., Webster A.C. Probiotics for people with hepatic encephalopathy. Cochrane Database Syst. Rev. 2017;2:CD008716. doi: 10.1002/14651858.CD008716.pub3.

238. Cao Q., Yu C.B., Yang S.G., Cao H.C., Chen P., Deng M., Li L.J. Effect of probiotic treatment on cirrhotic patients with minimal hepatic encephalopathy: A meta-analysis. Hepatobiliary Pancreat. Dis. Int. 2018;17:9–16. doi: 10.1016/j.hbpd.2018.01.005.

239. Núñez F.P., Quera R., Bay C., Thomson P. Fecal microbiota transplant, its usefulness beyond Clostridioides difficile in gastrointestinal diseases. Gastroenterol. Hepatol. 2022;45:223–230. doi: 10.1016/j.gastrohep.2021.05.009.

240. Kao D., Roach B., Park H., Hotte N., Madsen K., Bain V., Tandon P. Fecal microbiota transplantation in the management of hepatic encephalopathy. Hepatology. 2016;63:339–340. doi: 10.1002/hep.28121.

241. Bajaj J.S., Kassam Z., Fagan A., Gavis E.A., Liu E., Cox I.J., Kheradman R., Heuman D., Wang J., Gurry T., et al. Fecal microbiota transplant from a rational stool donor improves hepatic encephalopathy: A randomized clinical trial. Hepatology. 2017;66:1727–1738. doi: 10.1002/hep.29306.

242. Bajaj J.S., Salzman N.H., Acharya C., Sterling R.K., White M.B., Gavis E.A., Fagan A., Hayward M., Holtz M.L., Matherly S., et al. Fecal Microbial Transplant Capsules Are Safe in Hepatic Encephalopathy: A Phase 1, Randomized, Placebo-Controlled Trial. Hepatology. 2019;70:1690–1703. doi: 10.1002/hep.30690.

243. Philips C.A., Augustine P. Gut Barrier and Microbiota in Cirrhosis. J. Clin. Exp. Hepatol. 2022;12:625–638. doi: 10.1016/j.jceh.2021.08.027.

244. Tun K.M., Hong A.S., Batra K., Naga Y., Ohning G. A Systematic Review of the Efficacy and Safety of Fecal Microbiota Transplantation in the Treatment of Hepatic Encephalopathy and Clostridioides difficile Infection in Patients with Cirrhosis. Cureus. 2022;14:e25537. doi: 10.7759/cureus.25537.

245. Kircheis G., Lüth S. Pharmacokinetic and Pharmacodynamic Properties of L-Ornithine L-Aspartate (LOLA) in Hepatic Encephalopathy. Drugs. 2019;79((Suppl. 1)):23–29. doi: 10.1007/s40265-018-1023-2.

246. Butterworth R.F. Beneficial effects of L-ornithine L-aspartate for prevention of overt hepatic encephalopathy in patients with cirrhosis: A systematic review with meta-analysis. Metab. Brain Dis. 2020;35:75–81. doi: 10.1007/s11011-019-00463-8.

247. Mittal V.V., Sharma B.C., Sharma P., Sarin S.K. A randomized controlled trial comparing lactulose, probiotics, and L-ornithine L-aspartate in treatment

of minimal hepatic encephalopathy. Eur. J. Gastroenterol. Hepatol. 2011;23:725–732. doi: 10.1097/MEG.0b013e32834696f5.

248. Goh E.T., Stokes C.S., Sidhu S.S., Vilstrup H., Gluud L.L., Morgan M.Y. L-ornithine L-aspartate for prevention and treatment of hepatic encephalopathy in people with cirrhosis. Cochrane Database Syst. Rev. 2018;5:CD012410. doi: 10.1002/14651858.CD012410.pub2.
249. Jain A., Sharma B.C., Mahajan B., Srivastava S., Kumar A., Sachdeva S., Sonika U., Dalal A. L-ornithine L-aspartate in acute treatment of severe hepatic encephalopathy: A double-blind randomized controlled trial. Hepatology. 2022;75:1194–1203. doi: 10.1002/hep.32255.
250. Hoilat G.J., Ayas M.F., Hoilat J.N., Abu-Zaid A., Durer C., Durer S., Adhami T., John S. Polyethylene glycol versus lactulose in the treatment of hepatic encephalopathy: A systematic review and meta-analysis. BMJ Open Gastroenterol. 2021;8:e000648. doi: 10.1136/bmjgast-2021-000648.
251. Li M., Zhang Z., Chen Q., Zhou X., Shui D., Huang J. Comparative Effectiveness and Safety of Polyethylene Glycol Electrolyte Solution Versus Lactulose for Treatment of Hepatic Encephalopathy: A Systematic Review and Meta-analysis. J. Clin. Gastroenterol. 2022;56:41–48. doi: 10.1097/MCG.0000000000001621.
252. Gluud L.L., Dam G., Les I., Marchesini G., Borre M., Aagaard N.K., Vilstrup H. Branched-chain amino acids for people with hepatic encephalopathy. Cochrane Database Syst. Rev. 2017;5:CD001939. doi: 10.1002/14651858.CD001939.pub4.

253. Dr.S. KVirmani, Dr.P.K.Gupta in IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 17, Issue 7 Ver. 10 (July. 2018), PP 17-22

254. Karin Weissenborn, Martin Bokemeyer, Jochen Krause, Jochen Ennen and Bjo¨rn Ahl in AIDS 2005, 19 (suppl 3):S93–S98

255. Muhammad Omar Qureshi, Nasir Khokhar and Farzana Shafqat IN Journal of the College of Physicians and Surgeons Pakistan 2014, Vol. 24 (3): 160-163

256. Poordad FF. Review article: the burden of hepatic encephalopathy. Aliment Pharmacol Ther. 2007 Feb;25 Suppl 1:3-9.

257. Yoshida T, Kawata H, Fukui O, Koizumi T, Asada M, Wada M. Cirrhosis of liver in Japan . Acta Hepatolosplenol 1965;12: 268-78

258. Jong Hoon Kim, June Sung Lee, Seuk Hyun Lee, Won Ki Bae, Nam-Hoon Kim, Kyung-Ah Kim et al. The Association Between the Serum Sodium Level and the Severity of Complications in Liver Cirrhosis. Korean J Intern Med 2009; 24:106-12.

259. Andreu M.; Sola R. and Sitges-Seraa A. (1993): Risk factors for spontaneous bacterial peritonitis in cirrhotic patients with ascites. Gastroenterology, 104: 1133-38.

260. Toledo.Spontaneous bacterial peritonitis in cirrhpsis.Hepatology. vol. 17 (1), 1913, 251-57

261. Guarner C; Sola R, and Soriano G. Risk of a first community aquired spontaneous bacterial peritonitis in cirrhotics with low ascitic fluid protein levels. Gastroenterology;1999 117: 414-19.

262. Aparna Agrawal. clinicomicrobiological profile of SBP in cirrhosis of liver. JAPI 2001, vol. 49: 50

263. R Maskey,P Karki, SV Ahmed , DN Manandhar, Clinical profile of patients with cirrhosis of liver in a tertiary care hospital, Dharan, Nepal, Nepal Med Coll J 2011; 13(2): 115-118

264. Chakravarthy C. Community workers estimate of drinking and alcohol-related problems in rural areas. Indian J Psychol Med, 1999;13:49–56.

265. Nagarajaiah RB. A clinicoepidemiological profile of liver cirrhosis patients - A hospital based study. Int J Health Sci Res. 2014;4(2):21-25.

266. Rajesh baheti. Seroprevalence of HCV antibodies in patients with liver disorders JAPI 2000, vol. 48 (1), 26.

267. Sarin SK, Chari S, Sundaram KR, Ahuja RK, Anand BS, Broor SL. Young versus adult cirrhosis: a prospective comparative analysis of the clinical profile, natural course and survival. Gut 1988; 29: 101-7.

268. R Sanyal et. al. Prevalence of HCV in cirrhotic at a tertiary centre in eastern India JAPI 2000, vol. 48,1-113.

269. Souheil Abou-Assi MD & Z. Reno Vlahcevic MD,Hepatic encephalopathy, Postgraduate Medicine, 2001; 109:2, 52-70.

270. Abid S, Jafri W, Mumtaz K, Islam M, Abbas Z, Shah HA. Efficacy of L-ornithine-L-aspartate as an adjuvant therapy in cirrhotic patients with hepatic encephalopathy. J Coll Physicians Surg. 2011;21:666–671.

271. Abou-Assi S, Vlahcevic ZR. Hepatic encephalopathy. Metabolic consequence of cirrhosis often is reversible. Postgrad Med. 2001;109:52–70.

272. Alam I, Razaullah HI, Humayun M, Taqweem MA, Nisar M. Spectrum of precipitating factors of hepatic encephalopathy in liver cirrhosis. Pak J Med Res. 2005;44:96–100.

273. Zakaria M, UR-Rehman M, But A. Precipitating factors of hepatic encephalopathy among Sudanese patients with liver cirrhosis Professional Med J. 2008;15:375–379.

274. Bustamante J, Rimola A, Ventura PJ, Navasa M, Cirera I, Reggiardo V J Prognostic significance of hepatic encephalopathy in patients with cirrhosis. Hepatol. 1999;30:890–895.

275. Mahboob F. Frequency of risk factors for hepatic encephalopathy in patients of chronic liver disease. Ann King Edw Med Univ. 2003;9:29–30.

276. Devrajani BR, Shah SZ, Devrajani T, Kumar D. Precipitating factors of hepatic encephalopathy at a tertiary care hospital Jamshoro, Hyderabad. J Pak Med Assoc 2009;59:4.

277. Panchili M, Thomas V. Presence of multiple precipitating factors of hepatic encephalopathy lead to late recovery and more mortality in cirrhotic patients. J Clin Exp Hepatol 2015;5:S41.

278. Dhande SK, Selvi KC, Anand A, Aravind A, Premkumar K, Balamurali R, et al. 20. Precipitating factors of hepatic encephalopathy in liver cirrhosis and their impact on hospital stay and mortality-our center experience. J Clin Exp Hepatol 2018;8:S60-1.

279. Onyekwere C, Hameed L, Ogbera A. Chronic liver disease and hepatic encephalopathy: Clinical profile and outcomes. Niger J Clin Pract 2011;14:181.

ANNEXURES-I

INFORMED CONSENT FORM

Dear Mr. /Mrs. /Dr. _____, you are kindly requested to enroll yourself in a research study tilted, "**CLINICAL STUDY OF SPECTRUM OF PRECIPITATING FACTORS OF HEPATIC ENCEPHALOPATHY IN CIRRHOSIS OF LIVER"** being conducted by _____, a post graduate student in M.D. General Medicine and the study will be carried out under the direct supervision and guidance of _____, Professor, Department of General Medicine, Jawaharlal Nehru Medical College, Belgaum.

You have been requested to participate in this as you fit into the laid out criteria for a study 'subject'/ participant.

Your participation in study is voluntary. During the study you will be asked some questions and you are supposed to answer to the best of your knowledge. Your decision whether or not to participate in the study will not affect your treatment in any form. If you decide to participate you are free to withdraw at any time.

TITLE OF THE STUDY:

"**CLINICAL STUDY OF SPECTRUM OF PRECIPITATING FACTORS OF HEPATIC ENCEPHALOPATHY IN CIRRHOSIS OF LIVER**"

PURPOSE OF THE STUDY:

1) To study the clinical profile of hepatic encephalopathy in chronic liver disease.
2) To evaluate the clinical spectrum of precipitating factors of hepatic encephalopathy in patients with cirrhosis of liver.
3) To find out the correlation between venous blood Ammonia level to severity of Hepatic encephalopathy.

PROCEDURES INVOLVED: If you agree to enroll yourself in my study, you will be interviewed regarding your present, past and family history then you will be clinically examined in detail and investigated accordingly.

Then you will be subjected to

- Complete haemogram
- Random blood sugar
- Blood urea and Serum creatinine
- Liver function tests
- Serum electrolytes
- PT, aPTT, INR
- Urine routine and microscopy
- Stool for occult blood • Blood ammonia
- Chest radiograph
- Ultrasound abdomen
- Upper GI endoscopy

RISKS AND BENEFITS: There are no potential risks involved in this study.

Benefits of taking part in this research: By taking part in this study prognosis and risk of development of hepatic encephalopathy in cirrhosis of liver can be detected

VOLUNTARY PARTICIPATION / WITHDRAWAL FROM THE STUDY: Taking part in the study is voluntary. You may choose not to enroll yourself in this study and may choose to leave the study anytime in between.

ALTERNATIVES: Your decision regarding participation in study will not change present or future health care services offered to you at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum. You would simply be excluded

from the study if you wish to, and all your details shall be kept confidential and you will get the routine line of management.

PRIVACY AND CONFIDENTIALITY: All data collected or disclosed by you during the course of participation of study, will be kept fully confidential. If however during the course it becomes necessary for the progress of the course to disclose the identity, it would be done so only after your informed & written consent.The only people to know that you are a research subject are members of the research team. No information about you will be disclosed to other without your written permission except:

In emergency to protect your rights AND welfare.

If required by law.

AUTHORIZATION TO PUBLISH RESULT: The results of the study may be used to publish an article.When the results of research published or discussed, in a conference, no information will be displayed that would disclose your identity. Any information obtained in connection with this study and that can be identified with you will remain confidential.

FINANCIAL INCENTIVES FOR PARTICIPATION: No additional costs shall be incurred upon you for the purpose of this study. It is purely being done with the idea of research and all the cost of study will be borne by the investigator.

COMPENSATION:

In the event that you become injured as a result of taking part in this study, treatment will be offered to you at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum, or you will be given information about where to receive medical care. However, no reimbursement, compensation or free medical care will be given.

QUESTIONS/CONTACT DETAILS: You shall be free to contact the below mentioned name & addresses anytime during the study period for any clarification or help as you may desire for.

PRINCIPAL INVESTIGATOR:

Questions: In case of any questions with regard to this study, you are free to contact: "Name of student/PI, mobile number, email ID" If you have any question or complaints with regard to your right as study participant you may contact Dr Harsha Hegde, Chairperson, Ethical committee of JNMC, 0831-2473777 Extension 4052.

CONSENT FORM FORMAT

KAHERs JNMC

BELAGAVI

INFORMED CONSENT FORM

"TITLE OF THE PROJECT/STUDY"

Name of Student/Principal Investigator:

Name of Guide/Co Investigators:

Objective:

Introduction:

Explanation of procedure:

Withdrawal from participation in the study: Participation in this study is voluntary. You will be free to decide whether to participate in this study or continue participation once enrolled. In case you decide to withdraw your participation, you are free to do so. However, please convey the decision to the principal investigator.

Possible benefits from participating in the study: You will/will not have nor get any benefits by participating in this study. The data gathered will help the population at large.

Possible risks from participating in the study: There are no risks involved in participating in this study.

Privacy and confidentiality: The information collected from you will be coded, to prevent any person from identifying you. Your identity will never be revealed. The data collected from you will be kept confidential and only processed or aggregated data will be used for publication.

Financial incentives: You will not receive any payment for participating in this study.

Authorization for publication of aggregated data: Results obtained after processing of the aggregated data will be published for scientific purposes and or presented to scientific groups. However, your identity will never be revealed.

Questions: In case of any questions with regard to this study, you are free to contact: "Name of student/PI, mobile number, email ID" If you have any question or complaints with regard to your right as study participant you may contact Dr Harsha Hegde, Chairperson, Ethical committee of JNMC, 0831-2473777 Extension 4052.

Legal rights: By signing this consent form, we are not waving any of your legal rights.

CONSENT STATEMENT

I am making a voluntary decision to participate in the study " **STUDY OF SPECTRUM OF PRECIPITATING FACTORS OF HEPATIC ENCEPHALOPATHY IN CIRRHOSIS OF LIVER**". My signature below indicates that I have decided to participate and I have read the information provided above or the information provided above has been read to me in the language that I understand best. I was given the opportunity to ask questions and that they have been answered to my satisfaction.

Name of the participant:

Signature or left thumb impression of the participant:

Name of the witness:

Signature or left thumb impression of the witness:

Name of the investigator:

Signature of the investigator:

ANNEXURE-II

PROFORMA

NAME :

AGE :

SEX :

OCCUPATION :

HOSPITAL :

IP NO. :

DOA:

DOD / DOE :

DAMA

CHIEF COMPLAINTS :

HISTORY OF PRESENTING ILLNESS :

- FEVER
- NAUSEA/VOMITING
- PAIN ABDOMEN
- DISTENSION OF ABDOMEN
- ABNORMAL BEHAVIOUR / COMA
- LOSS OF APPETITE
- DIARRHEA
- CONSTIPATION
- HEMETEMESIS
- MALENA
- SLEEP DISTURBANCE
- DECREASED URINE OUTPUT

- JAUNDICE
- SEIZURES

PRECIPITATING FACTORS :

- DEHYDRATION
- PARACENTESIS
- INFECTION
- GI BLEEDING (HAEMETEMESIS & MALENA)
- ELECTROLYTE IMBALANCE
- DIARRHOEA
- CONSTIPATION
- EXCESS PROTEIN INTAKE
- ALCOHOLISM
- DRUGS (SEDATIVES & DIURETICS)

PAST HISTORY :

- TREATMENT HISTORY
- PREVIOUS HOSPITAL ADMISSIONS

FAMILY HISTORY :

PERSONAL HISTORY :

- SMOKER
- ALCOHOLIC
- DIET
- APPETITE
- SLEEP
- BOWEL
- BLADDER

GENERAL PHYSICAL EXAMINATION :

- APPEARANCE
- ORIENTATION
- PALLOR/ICTERUS/CYANOSIS/CLUBBING /LYMPHADENOPATHY/EDEMA
- FLAPPING TREMOR
- HAIR
- TONGUE
- FETOR HEPATICUS
- TESTICULAR ATROPHY
- GYNECOMASTIA
- PALMAR ERYTHEMA

VITAL SIGNS :

- PULSE
- BP
- RR
- TEMPERATURE

SYSTEMIC EXAMINATION :

PER ABDOMEN :

- INSPECTION :

SHAPE

UMBLICUS

DILATED VEINS

- PALPATION :

TENDERNESS

ORGANOMEGALY (LIVER / SPLEEN)

• PERCUSSION :

FLUID THRILL

SHIFTING DULLNESS

. AUSCULTATION

CENTRAL NERVOUS SYSTEM :

- HIGHER MENTAL FUNCTIONS
- CRANIAL NERVES
- MOTOR SYSTEM
- SENSORY SYSTEM
- CEREBELLAR SIGNS
- MENINGEAL SIGNS
- SKULL AND SPINE

CARDIOVASCULAR SYSTEM :

- INSPECTION :
- PALPATION :
- PERCUSSION :
- AUSCULTATION :

RESPIRATORY SYSTEM :

- INSPECTION :
- PALPATION :
- PERCUSSION :
- AUSCULTATION :

CLINICAL DIAGNOSIS :

INVESTIGATIONS :

COMPLETE BLOOD COUNT :

- HEMOGLOBIN
- TC
- DC
- PLATELET COUNT
- ESR

COAGULATION PROFILE:

- PT
- aPTT
- INR

METABOLIC PROFILE:

- RBS
- BLOOD UREA
- S. CREATININE
- S. SODIUM
- S. POTASSIUM
- BLOOD AMMONIA

LIVER FUNCTION TESTS :

- S. BILIRUBIN
- S. TOTAL PROTEINS
- S. ALBUMIN
- S. GLOBULIN
- SGOT

- SGPT
- S.ALKALINE PHOSPHATASE

URINE ROUTINE & MICROSCOPY :

HBsAg :

ANTI HCV :

USG ABDOMEN :

STOOL FOR OCCULT BLOOD :

UPPER GI ENDOSCOPY:

FINAL DIAGNOSIS :

ANNEXURE III – MASTER CHART

SI NO	CASE NO	AGE(YEARS)	age group	SEX	DURATION OF HOSPITAL STAY(DAYS)	DURATION OF HOSPITAL STAY(DAYS)	Clinical features	PAST HISTORY/HISOTRY OF ALCOHOLISM	PULSE(PER MIN)	BLOOD PRESSURE(MMOFHG)	BLOOD PRESSURE(MMOFHG)	BLOOD PRESSURE(MMOFHG)	PALLOR	CLUBBING	ICTERUS	EDEMA FEET	JVP	CARDIOVASCULAR EXAMINATION	RESPIRATORY EXAMINATION	CENTRAL NERVOUS SYSTEM EXAMIANTION	PER ABDOMEN EXAMINATION	HEMOGLOBIN(gm/dl)	WBC	PLATELETS	URINE ALBUMIN	BUN(mg/dl)	SERUM CREATININE(mg/dl)	PROTHROMBIN TIME(SEC) /INR	Spontaneous bacterial peritonitis	Respiratory tract infection	Urinary tract infection	Dyselectrolytemia	Constipation	Gastrointestinal bleeding	PT	INR	ULTRASONOGRAPHY ABDOMEN	Liver surface	Ascitis	SERUM SODIUM(Meq/Lit)	HbsAg	anti HCV	TOTAL BILIRUBIN(mg/dl)	SGOT/SGPT(units/liter)	SGOT	SGPT	SERUM ALBUMIN(gm/dl)	TOTAL SERUM PROTEINS(gm/dl)	ASCITES	ENCEPHALOPATHY GRADE
1	1	52	51 to 60 years	MALE	5	5 to 10 days	JAUNDICE,EDEMA FEET,ABDOMINAL DISTENSION	ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,CONFUSED	DISTENDED,ASCITES	11.2	9700	110000	ABSENT	17	1.1	5/3.1	no	no	no	yes	no	yes	5	3.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	POSITIVE	NEGATIVE	10.2	121/86	121	86	2.1	5.8	MODERATE ASCITES	GRADE 3
2	2	63	more than 60 years	MALE	4	less than 5 days	DROWSINESS,JAUNDICE	ALCOHOLIC	84	120/84	12	84	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	8.9	4800	105000	ABSENT	19	0.8	11/5.0	no	no	no	no	no	no	11	5	IRREGULAR LIVER SURFACE,SLIGHT ASCITES	IRREGULAR LIVER SURFACE	SLIGHT ASCITES	125	NEGATIVE	NEGATIVE	7.6	156/101	156	101	2.4	6.2	SLIGHT ASCITES	GRADE2
3	3	48	41 to 50 years	FEMALE	7	5 to 10 days	JAUNDICE,EDEMA FEET,ABDOMINAL DISTENSION	NON ALCOHOLIC	88	110/80	110	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,INCOHERENT SPEECH	DISTENDED,ASCITES	10.8	6300	121000	ABSENT	16	1.3	11/3.8	no	no	no	yes	yes	yes	11	3.8	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	129	NEGATIVE	NEGATIVE	4.2	89/156	89	156	2.2	5.9	MODERATE ASCITES	GRADE 3
4	4	62	more than 60 years	MALE	3	less than 5 days	JAUNDICE,DROWSINESS,HEMETEMESIS	ALCOHOLIC	76	100/60	100	60	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	7.8	5800	95000	ABSENT	20	1.4	6/2.8	no	no	no	yes	no	no	6	2.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	122	NEGATIVE	NEGATIVE	5.4	88/143	88	143	1.8	6.2	SLIGHT ASCITES	GRADE 4
5	5	57	51 to 60 years	MALE	2	less than 5 days	JAUNDICE,DROWSINESS	NON ALCOHOLIC	72	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,CONFUSED	DISTENDED,ASCITES	10.7	4900	158000	ABSENT	17	0.8	8/2.6	no	yes	no	yes	yes	yes	8	2.6	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	126	NEGATIVE	NEGATIVE	8.2	211/282	211	282	3.1	5.9	MODERATE ASCITES	GRADE 3
6	6	50	41 to 50 years	MALE	3	less than 5 days	JANDICE,DROWSINESS	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	DISTENDED,ASCITES	11.8	5200	143000	ABSENT	19	0.9	11/3.4	no	no	no	no	no	no	11	3.4	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	118	NEGATIVE	NEGATIVE	5	98/134	98	134	2.2	6.6	MODERATE ASCITES	GRADE2
7	7	41	41 to 50 years	MALE	5	5 to 10 days	JAUNDICE,EDEMA FEET,ABDOMINAL DISTENSION	NON ALCOHOLIC	84	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	10.2	8900	128000	ABSENT	20	1.3	8/2.1	no	no	yes	yes	no	yes	8	2.1	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	126	NEGATIVE	NEGATIVE	5.8	98/162	98	162	2.7	5.8	MODERATE ASCITES	GRADE 3
8	8	52	51 to 60 years	MALE	2	less than 5 days	EDEMA FEET,DROWSINESS	NON ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	11.2	5700	105000	ABSENT	17	0.7	9/1.8	no	no	no	yes	yes	no	9	1.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	129	NEGATIVE	NEGATIVE	3.8	89/110	89	110	2.6	6.1	SLIGHT ASCITES	GRADE 4
9	9	46	41 to 50 years	MALE	4	less than 5 days	JAUNDICE,DROWSINESS,ABDOMINAL DISTENSION	NON ALCOHOLIC	81	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	10.8	7200	181000	ABSENT	17	1	16/3.4	yeses	no	no	yes	no	yes	16	3.4	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	121	NEGATIVE	NEGATIVE	8.4	181/230	181	230	3.1	6	MODERATE ASCITES	GRADE 4
10	10	61	more than 60 years	MALE	3	less than 5 days	JAUNDICE,EDEMA FEET,DROWSINESS	ALCOHOLIC	84	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	SOFT NON TENDER	11.4	4700	116000	ABSENT	18	1.1	11/2.8	no	no	no	yes	no	no	11	2.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	129	NEGATIVE	NEGATIVE	4.2	129/191	129	191	2.6	5.8	SLIGHT ASCITES	GRADE 3
11	11	49	41 to 50 years	FEMALE	4	less than 5 days	JAUNDICE,UNCONSCIOUS	NON ALCOHOLIC	88	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	10.8	6300	154000	ABSENT	20	0.9	8/2.7	no	yeses	no	yes	no	yes	8	2.7	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	125	POSITIVE	NEGATIVE	11.2	340/430	340	430	3.1	6.3	MODERATE ASCITES	GRADE 4
12	12	43	41 to 50 years	MALE	3	less than 5 days	JAUNDICE,DROWSINESS,ABDOMINAL DISTENSION	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	11	5200	168000	ABSENT	17	1	16/2.7	yeses	yes	yes	yes	yes	no	16	2.7	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	118	NEGATIVE	NEGATIVE	6.2	123/209	123	209	1.8	5.8	MODERATE ASCITES	GRADE 4
13	13	54	51 to 60 years	MALE	6	5 to 10 days	JAUNDICE,DROWSINESS,EDEMA FEET	ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	10.4	8600	201000	ABSENT	19	1.4	14/2.3	no	no	no	yes	no	no	14	2.3	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	123	NEGATIVE	NEGATIVE	4.3	89/143	89	143	3.1	6.2	SLIGHT ASCITES	GRADE 4
14	14	43	41 to 50 years	MALE	4	less than 5 days	JAUNDICE,DROWSINESS,	ALCOHOLIC	84	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	11.4	9200	156000	ABSENT	20	1.3	16/1.8	no	no	no	yes	no	no	16	1.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	120	NEGATIVE	NEGATIVE	6.2	96/150	96	150	2.8	6	SLIGHT ASCITES	GRADE 4
15	15	51	51 to 60 years	MALE	5	5 to 10 days	ABDOMINAL DISTENSION,JAUNDICE,DROWSINESS	NON ALCOHOLIC	88	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	12.3	5600	134000	ABSENT	19	1.5	18/2.3	no	no	no	yes	yes	yes	18	2.3	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	129	NEGATIVE	NEGATIVE	8.9	201/240	201	240	1.6	5.9	MODERATE ASCITES	GRADE 3
16	16	54	51 to 60 years	MALE	6	5 to 10 days	ABDOMINAL DISTENSION,JAUNDICE,DROWSINESS	NON ALCOHOLIC	76	100/70	100	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11.8	6400	201000	ABSENT	20	1.1	18/3.2	no	yes	no	yes	no	no	18	3.2	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	126	NEGATIVE	NEGATIVE	12.3	187/222	187	222	2.6	5.7	MODERATE ASCITES	GRADE 4
17	17	43	41 to 50 years	MALE	3	less than 5 days	JAUNDICE,DROWSINESS	ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	12.1	5300	156000	ABSENT	19	1.4	16/2.8	no	no	no	yes	no	no	16	2.8	IRREGULAR LIVER SURFACE,SLIGHT ASCITES	IRREGULAR LIVER SURFACE	SLIGHT ASCITES	123	NEGATIVE	NEGATIVE	6.2	123/270	123	270	1.8	6.2	SLIGHT ASCITES	GRADE 4
18	18	48	41 to 50 years	MALE	4	less than 5 days	FEVER,WEAKNESS,DECREASE APPETITE	ALCOHOLIC	76	110/60	110	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	SOFT NON TENDER	11.6	6400	230000	ABSENT	16	1.1	16/2.8	no	no	no	no	no	no	16	2.8	IRREGULAR LIVER SURFACE,SLIGHT ASCITES	IRREGULAR LIVER SURFACE	SLIGHT ASCITES	128	NEGATIVE	NEGATIVE	3.8	156/200	156	200	3.8	6.5	SLIGHT ASCITES	GRADE2
19	19	53	51 to 60 years	MALE	3	less than 5 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	83	100/60	100	60	ABSENT	ABSENT	ABSENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	DISTENDED,ASCITES	10.8	6500	158000	ABSENT	19	1.7	8/1.7	no	no	no	no	no	no	8	1.7	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	125	NEGATIVE	NEGATIVE	2.8	123/198	123	198	3.2	6.8	MODERATE ASCITES	GRADE2
20	20	58	51 to 60 years	MALE	8	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	80	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	DISTENDED,ASCITES	12.1	8600	201000	ABSENT	11	0.8	16/2.3	no	no	no	no	no	no	16	2.3	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	4.2	201/286	201	286	2.6	5.7	MODERATE ASCITES	GRADE2
21	21	63	more than 60 years	MALE	9	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	DISTENDED,ASCITES	10.8	4600	176000	ABSENT	15	0.9	20/2.1	no	no	no	no	no	no	20	2.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	121	NEGATIVE	NEGATIVE	5.2	105/190	105	190	3.1	6.1	MODERATE ASCITES	GRADE2
22	22	53	51 to 60 years	MALE	6	5 to 10 days	EDEMA FEET,HEMETEMESIS,JAUNDICE	ALCOHOLIC	72	100/60	100	60	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	SOFT NON TENDER	8.5	7300	89000	ABSENT	18	1.4	22/2.0	no	no	no	no	no	no	22	2	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	124	NEGATIVE	NEGATIVE	4.1	89/110	89	110	2.9	5.6	SLIGHT ASCITES	GRADE1
23	23	62	more than 60 years	MALE	8	5 to 10 days	IRRELEVANT SPEECH,JAUNDICE	NON ALCOHOLIC	88	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ALTERED SLEEP CYCLE	SOFT NON TENDER	12.1	9700	105000	ABSENT	17	1.3	11/1.8	no	no	no	no	no	no	11	1.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	129	NEGATIVE	NEGATIVE	5.6	110/199	110	199	3.2	6.3	SLIGHT ASCITES	GRADE1
24	24	43	41 to 50 years	MALE	5	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	84	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	10.5	5600	120000	ABSENT	19	1.8	20/2.0	no	no	no	no	no	no	20	2	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	125	NEGATIVE	NEGATIVE	6.1	129/197	129	197	2	5.8	MODERATE ASCITES	GRADE2
25	25	48	41 to 50 years	MALE	7	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ALTERED SLEEP CYCLE	DISTENDED,ASCITES	11.2	7200	198000	ABSENT	17	0.6	22/2.3	no	no	no	no	no	no	22	2.3	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	3.8	204/287	204	287	1.8	6.3	MODERATE ASCITES	GRADE2
26	26	53	51 to 60 years	MALE	6	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	84	110/60	110	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	DISTENDED,ASCITES	10.6	8900	105000	ABSENT	19	1.4	18/2.1	no	no	no	no	no	no	18	2.1	IRREGULAR LIVER SURAFCE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	129	POSITIVE	NEGATIVE	5.3	107/209	107	209	2.9	5.9	MODERATE ASCITES	GRADE2
27	27	61	more than 60 years	MALE	8	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	ALCOHOLIC	72	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ALTERED SLEEP CYCLE	DISTENDED,ASCITES	12.1	4700	201000	ABSENT	20	1.7	12/1.8	no	no	no	no	no	no	12	1.8	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	124	NEGATIVE	NEGATIVE	4.8	209/287	209	287	2.9	6.1	MODERATE ASCITES	GRADE1
28	28	42	41 to 50 years	MALE	9	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	ALCOHOLIC	88	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11.2	8700	189000	ABSENT	14	1.3	16/2.1	no	no	no	no	no	no	16	2.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	5.1	187/206	187	206	3.1	5.9	MODERATE ASCITES	GRADE2
29	29	52	51 to 60 years	MALE	7	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	DISTENDED,ASCITES	10.3	9800	201000	ABSENT	17	1.1	16/1.8	no	no	no	no	no	no	16	1.8	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	126	NEGATIVE	NEGATIVE	4.6	200/245	200	245	2.9	6.3	MODERATE ASCITES	GRADE2
30	30	48	41 to 50 years	MALE	6	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	88	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	12.3	5600	117000	ABSENT	14	0.9	20/1.6	no	no	no	no	no	no	20	1.6	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	125	NEGATIVE	NEGATIVE	5.6	187/205	187	205	3.2	5.7	MODERATE ASCITES	GRADE2
31	31	61	more than 60 years	MALE	8	5 to 10 days	WEAKNESS,HEMETEMESIS,JAUNDICE	NON ALCOHOLIC	76	100/70	100	60	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	SOFT NON TENDER	8.7	7600	167000	ABSENT	18	1.6	16/1.6	no	no	no	no	no	no	16	1.6	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	121	NEGATIVE	NEGATIVE	6.1	200/276	200	276	2	6.1	SLIGHT ASCITES	GRADE2
32	32	57	51 to 60 years	MALE	6	5 to 10 days	JAUNDICE,WEAKNESS,VOMITING	NON ALCOHOLIC	88	120/80	12	80	ABSENT	ABSENT	PRESENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ALTERED SLEEP CYCLE	SOFT NON TENDER	12.7	6500	226000	ABSENT	10	1.1	11/1.6	no	no	no	no	no	no	11	1.6	NODULAR LIVER SURFACE,NO ASCITES	NODULAR LIVER SURFACE	NO ASCITES	138	NEGATIVE	NEGATIVE	3.8	187/200	187	200	3.8	6.8	NO ASCITES	GRADE1
33	33	62	more than 60 years	MALE	5	5 to 10 days	JAUNDICE,FEVER	ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	11.8	6700	306000	ABSENT	14	1.3	6/1.1	no	no	no	no	no	no	6	1.1	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	133	NEGATIVE	NEGATIVE	4.1	115/167	115	167	4.1	6.7	SLIGHT ASCITES	GRADE1
34	34	43	41 to 50 years	MALE	6	5 to 10 days	FEVER,WEAKNESS,DECREASE APPETITE	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	ABSENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	12.3	6400	230000	ABSENT	12	1.1	6/1.1	no	no	no	no	no	no	6	1.1	NODULAR LIVER SURFRACE,NO ASCITES	NODULAR LIVER SURFACE	NO ASCITES	136	NEGATIVE	NEGATIVE	2.8	120/165	120	165	3.8	6.7	NO ASCITES	ABSENT ENCEPHALOPATHY
35	35	51	51 to 60 years	MALE	5	5 to 10 days	WEAKNESS,VOMITING	NON ALCOHOLIC	76	120/80	12	80	ABSENT	ABSENT	ABSENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	11.8	5400	222000	ABSENT	17	1	4/1.1	no	no	no	no	no	no	4	1.1	NODULAR LIVER SURFACE,NO ASCITES	NODULAR LIVER SURFACE	NO ASCITES	141	NEGATIVE	NEGATIVE	2.3	89/101	89	101	4.2	6.3	NO ASCITES	ABSENT ENCEPHALOPATHY
36	36	53	51 to 60 years	FEMALE	8	5 to 10 days	EDEMA FEET,DROWSINESS	NON ALCOHOLIC	88	110/70	110	70	ABSENT	ABSENT	ABSENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	SOFT NON TENDER	10.7	4300	109000	ABSENT	14	1.6	18/2.3	no	no	no	no	no	no	18	2.3	NODULAR LIVER SURAFCE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	126	NEGATIVE	POSITIVE	2	105/176	105	176	3.1	5.8	SLIGHT ASCITES	GRADE2
37	37	49	41 to 50 years	MALE	4	less than 5 days	JAUNDICE,DROWSINESS,ABDOMINAL DISTENSION	NON ALCOHOLIC	76	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11.1	6700	118000	ABSENT	20	1.5	20/2.1	no	no	yes	yes	yes	no	20	2.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	121	NEGATIVE	POSITIVE	6.3	200/287	200	287	2.3	5.8	MODERATE ASCITES	GRADE 3
38	38	59	51 to 60 years	MALE	3	less than 5 days	JAUNDICE,UNCONSCIOUS,ABDOMINAL DISTENSION	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	12.7	5400	145000	ABSENT	19	1.3	22/1.8	no	yeses	no	yes	no	yes	22	1.8	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	127	NEGATIVE	POSITIVE	8.2	165/290	165	290	2.8	6.1	MODERATE ASCITES	GRADE 4
39	39	61	more than 60 years	MALE	8	5 to 10 days	JAUNDICE,DROWSINESS	ALCOHOLIC	76	120/80	112	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	SOFT NON TENDER	10.9	7800	201000	ABSENT	14	1	20/2.6	no	no	no	yes	yes	no	20	2.6	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	125	NEGATIVE	POSITIVE	5.3	110/198	110	198	3.2	5.6	SLIGHT ASCITES	GRADE 3
40	40	50	41 to 50 years	MALE	5	5 to 10 days	JAUNDICE,DROWSINESS,ABDOMINAL DISTENSION	NON ALCOHOLIC	84	110/76	110	76	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	9.8	4300	167000	ABSENT	18	1.6	22/3.6	yeses	yes	no	yes	no	no	22	3.6	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	POSITIVE	10.6	206/287	206	287	2	5.3	MODERATE ASCITES	GRADE 4
41	41	45	41 to 50 years	MALE	9	5 to 10 days	JAUNDICE,HEMETEMESIS	NON ALCOHOLIC	76	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	SOFT NON TENDER	10.6	7800	201000	ABSENT	14	1.1	18/1.8	no	no	no	no	no	no	18	1.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	127	NEGATIVE	POSITIVE	4.1	109/190	109	190	3.2	6.1	SLIGHT ASCITES	GRADE2
42	42	49	41 to 50 years	MALE	4	less than 5 days	JAUNDICE,ABDOMINAL DISTENSION,DROWSINESS	ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	9.8	5600	157000	ABSENT	11	1.4	20/2.8	yeses	yeses	no	yes	yes	yes	20	2.8	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	121	NEGATIVE	NEGATIVE	15.2	298/201	298	201	3	5.4	MODERATE ASCITES	GRADE 4
43	43	59	51 to 60 years	MALE	3	less than 5 days	JAUNDICE,HEMETEMESIS,ABDOMINAL DISTENSION	ALCOHOLIC	76	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11	4300	201000	ABSENT	18	1.7	22/3.1	no	no	yes	yes	no	no	22	3.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	119	NEGATIVE	NEGATIVE	8.6	354/254	354	254	3	6.1	MODERATE ASCITES	GRADE 3
44	44	45	41 to 50 years	MALE	8	5 to 10 days	FEVER,VOMITING,WEAKNESS	ALCOHOLIC	88	110/70	110	70	ABSENT	ABSENT	ABSENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	10	3800	243000	ABSENT	14	1.4	6/1.1	no	no	no	no	no	no	6	1.1	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	132	NEGATIVE	NEGATIVE	1.8	89/43	89	43	3.6	6.8	SLIGHT ASCITES	ABSENT ENCEPHALOPATHY
45	45	57	51 to 60 years	MALE	3	less than 5 days	JAUNDICE,EDEMA FEET,ALTERED SLEEP PATTERN	ALCOHOLIC	72	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	DISTENDED,ASCITES	11.1	7800	230000	ABSENT	17	1.5	16/3.0	no	no	no	no	no	no	16	3	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	14.2	345/126	345	126	1.8	5.3	MODERATE ASCITES	GRADE2
46	46	46	41 to 50 years	MALE	2	less than 5 days	JAUNDICE,HEMETEMESIS	ALCOHOLIC	88	110/70	110	70	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	9.7	6700	211000	ABSENT	20	1.1	14/1.8	no	no	no	no	no	no	14	1.8	NODULAR,IRREGULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	126	NEGATIVE	NEGATIVE	8.2	289/123	289	123	3.1	5.8	SLIGHT ASCITES	GRADE2
47	47	43	41 to 50 years	FEMALE	5	5 to 10 days	JAUNDICE,EDEMA FEET	NON ALCOHOLIC	84	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	10.3	7600	245000	ABSENT	18	1.4	24/2.1	no	yes	yes	yes	yes	yes	24	2.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	8.2	233/167	233	167	1.8	6.7	MODERATE ASCITES	GRADE 3
48	48	56	51 to 60 years	MALE	4	less than 5 days	JAUNDICE.EDEMA FEET,DROWSINESS	NON ALCOHOLIC	76	110/76	110	76	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11.8	9800	320000	ABSENT	20	1.8	16/1.8	no	no	yes	yes	no	no	16	1.8	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	124	NEGATIVE	NEGATIVE	4.8	189/201	189	201	2.8	5.6	MODERATE ASCITES	GRADE 4
49	49	63	more than 60 years	MALE	9	5 to 10 days	FEVER,HEMETEMESIS	NON ALCOHOLIC	84	120/80	12	80	ABSENT	ABSENT	ABSENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	12.3	7800	235000	ABSENT	16	1.3	6/1.2	no	no	no	no	no	no	6	1.2	NODULAR LIVER SURFACE,NO ASCITES	NODULAR LIVER SURFACE	NO ASCITES	136	NEGATIVE	NEGATIVE	2.3	345/335	345	335	4.5	6.7	NO ASCITES	ABSENT ENCEPHALOPATHY
50	50	54	51 to 60 years	MALE	6	5 to 10 days	ABDOMINAL PAIN ,VOMITING	NON ALCOHOLIC	72	110/70	110	70	ABSENT	ABSENT	ABSENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	11.3	4500	167000	ABSENT	14	1	8/1.1	no	no	no	no	no	no	8	1.1	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	138	NEGATIVE	NEGATIVE	1.9	245/267	245	267	4.2	6.4	SLIGHT ASCITES	ABSENT ENCEPHALOPATHY
51	51	52	51 to 60 years	MALE	5	5 to 10 days	JAUNDICE,EDEMA FEET,ABDOMINAL DISTENSION	ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,CONFUSED	DISTENDED,ASCITES	11.2	9700	110000	ABSENT	17	1.1	5/3.1	no	no	yes	yes	no	yes	5	3.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	10.2	121/86	121	86	2.1	5.8	MODERATE ASCITES	GRADE 3
52	52	63	more than 60 years	MALE	4	less than 5 days	DROWSINESS,JAUNDICE	ALCOHOLIC	84	120/84	12	84	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	8.9	4800	105000	ABSENT	19	0.8	11/5.0	no	no	no	no	no	no	11	5	IRREGULAR LIVER SURFACE,SLIGHT ASCITES	IRREGULAR LIVER SURFACE	SLIGHT ASCITES	125	NEGATIVE	NEGATIVE	7.6	156/101	156	101	2.4	6.2	SLIGHT ASCITES	GRADE2
53	53	48	41 to 50 years	FEMALE	7	5 to 10 days	JAUNDICE,EDEMA FEET,ABDOMINAL DISTENSION	NON ALCOHOLIC	88	110/80	110	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,INCOHERENT SPEECH	DISTENDED,ASCITES	10.8	6300	121000	ABSENT	16	1.3	11/3.8	no	no	no	no	yes	no	11	3.8	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	129	NEGATIVE	NEGATIVE	4.2	89/156	89	156	2.2	5.9	MODERATE ASCITES	GRADE 3
54	54	62	more than 60 years	MALE	3	less than 5 days	JAUNDICE,DROWSINESS,HEMETEMESIS	ALCOHOLIC	76	100/60	100	60	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	7.8	5800	95000	ABSENT	20	1.4	6/2.8	no	no	no	no	no	no	6	2.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	122	NEGATIVE	NEGATIVE	5.4	88/143	88	143	1.8	6.2	SLIGHT ASCITES	GRADE 4
55	55	57	51 to 60 years	MALE	2	less than 5 days	JAUNDICE,DROWSINESS	NON ALCOHOLIC	72	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,CONFUSED	DISTENDED,ASCITES	10.7	4900	158000	ABSENT	17	0.8	8/2.6	no	yes	yes	yes	yes	no	8	2.6	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	126	NEGATIVE	NEGATIVE	8.2	211/282	211	282	3.1	5.9	MODERATE ASCITES	GRADE 3
56	56	50	41 to 50 years	MALE	3	less than 5 days	JANDICE,DROWSINESS	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	DISTENDED,ASCITES	11.8	5200	143000	ABSENT	19	0.9	11/3.4	no	no	no	no	no	no	11	3.4	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	118	NEGATIVE	NEGATIVE	5	98/134	98	134	2.2	6.6	MODERATE ASCITES	GRADE2
57	57	41	41 to 50 years	MALE	5	5 to 10 days	JAUNDICE,EDEMA FEET,ABDOMINAL DISTENSION	NON ALCOHOLIC	84	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	10.2	8900	128000	ABSENT	20	1.3	8/2.1	no	no	yes	yes	no	no	8	2.1	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	126	NEGATIVE	NEGATIVE	5.8	98/162	98	162	2.7	5.8	MODERATE ASCITES	GRADE 3
58	58	52	51 to 60 years	MALE	2	less than 5 days	EDEMA FEET,DROWSINESS	NON ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	11.2	5700	105000	ABSENT	17	0.7	9/1.8	no	no	no	no	yes	no	9	1.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	129	NEGATIVE	NEGATIVE	3.8	89/110	89	110	2.6	6.1	SLIGHT ASCITES	GRADE 4
59	59	46	41 to 50 years	MALE	4	less than 5 days	JAUNDICE,DROWSINESS,ABDOMINAL DISTENSION	NON ALCOHOLIC	81	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	10.8	7200	181000	ABSENT	17	1	16/3.4	yeses	yes	no	yes	no	yes	16	3.4	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	121	NEGATIVE	NEGATIVE	8.4	181/230	181	230	3.1	6	MODERATE ASCITES	GRADE 4
60	60	61	more than 60 years	MALE	3	less than 5 days	JAUNDICE,EDEMA FEET,DROWSINESS	ALCOHOLIC	84	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	SOFT NON TENDER	11.4	4700	116000	ABSENT	18	1.1	11/2.8	no	no	no	no	yes	no	11	2.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	129	NEGATIVE	NEGATIVE	4.2	129/191	129	191	2.6	5.8	SLIGHT ASCITES	GRADE 3
61	61	49	41 to 50 years	FEMALE	4	less than 5 days	JAUNDICE,UNCONSCIOUS	NON ALCOHOLIC	88	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	10.8	6300	154000	ABSENT	20	0.9	8/2.7	no	yes	yes	yes	no	no	8	2.7	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	125	NEGATIVE	NEGATIVE	11.2	340/430	340	430	3.1	6.3	MODERATE ASCITES	GRADE 4
62	62	43	41 to 50 years	MALE	3	less than 5 days	JAUNDICE,DROWSINESS,ABDOMINAL DISTENSION	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	11	5200	168000	ABSENT	17	1	16/2.7	no	no	no	no	yes	yes	16	2.7	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	118	POSITIVE	NEGATIVE	6.2	123/209	123	209	1.8	5.8	MODERATE ASCITES	GRADE 4
63	63	54	51 to 60 years	MALE	6	5 to 10 days	JAUNDICE,DROWSINESS,EDEMA FEET	ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	10.4	8600	201000	ABSENT	19	1.4	14/2.3	no	no	no	yes	no	no	14	2.3	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	123	NEGATIVE	NEGATIVE	4.3	89/143	89	143	3.1	6.2	SLIGHT ASCITES	GRADE 4
64	64	43	41 to 50 years	MALE	4	less than 5 days	JAUNDICE,DROWSINESS,	ALCOHOLIC	84	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	11.4	9200	156000	ABSENT	20	1.3	16/1.8	no	no	no	no	yes	no	16	1.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	120	NEGATIVE	NEGATIVE	6.2	96/150	96	150	2.8	6	SLIGHT ASCITES	GRADE 4
65	65	51	51 to 60 years	MALE	5	5 to 10 days	ABDOMINAL DISTENSION,JAUNDICE,DROWSINESS	NON ALCOHOLIC	88	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	12.3	5600	134000	ABSENT	19	1.5	18/2.3	no	yes	yes	yes	no	yes	18	2.3	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	129	NEGATIVE	NEGATIVE	8.9	201/240	201	240	1.6	5.9	MODERATE ASCITES	GRADE 3
66	66	54	51 to 60 years	MALE	6	5 to 10 days	ABDOMINAL DISTENSION,JAUNDICE,DROWSINESS	NON ALCOHOLIC	76	100/70	100	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11.8	6400	201000	ABSENT	20	1.1	18/3.2	yeses	yes	yes	yes	yes	no	18	3.2	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	126	NEGATIVE	NEGATIVE	12.3	187/222	187	222	2.6	5.7	MODERATE ASCITES	GRADE 4
67	67	43	41 to 50 years	MALE	3	less than 5 days	JAUNDICE,DROWSINESS	ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	12.1	5300	156000	ABSENT	19	1.4	16/2.8	no	no	no	no	yes	no	16	2.8	IRREGULAR LIVER SURFACE,SLIGHT ASCITES	IRREGULAR LIVER SURFACE	SLIGHT ASCITES	123	NEGATIVE	NEGATIVE	6.2	123/270	123	270	1.8	6.2	SLIGHT ASCITES	GRADE 4
68	68	48	41 to 50 years	MALE	4	less than 5 days	FEVER,WEAKNESS,DECREASE APPETITE	ALCOHOLIC	76	110/60	110	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	SOFT NON TENDER	11.6	6400	230000	ABSENT	16	1.1	16/2.8	no	no	no	no	no	no	16	2.8	IRREGULAR LIVER SURFACE,SLIGHT ASCITES	IRREGULAR LIVER SURFACE	SLIGHT ASCITES	128	NEGATIVE	NEGATIVE	3.8	156/200	156	200	3.8	6.5	SLIGHT ASCITES	GRADE2
69	69	53	51 to 60 years	MALE	3	less than 5 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	83	100/60	100	60	ABSENT	ABSENT	ABSENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	DISTENDED,ASCITES	10.8	6500	158000	ABSENT	19	1.7	8/1.7	no	no	no	no	no	no	8	1.7	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	125	NEGATIVE	NEGATIVE	2.8	123/198	123	198	3.2	6.8	MODERATE ASCITES	GRADE2
70	70	58	51 to 60 years	MALE	8	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	80	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	DISTENDED,ASCITES	12.1	8600	201000	ABSENT	11	0.8	16/2.3	no	no	no	no	no	no	16	2.3	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	4.2	201/286	201	286	2.6	5.7	MODERATE ASCITES	GRADE2
71	71	63	more than 60 years	MALE	9	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	DISTENDED,ASCITES	10.8	4600	176000	ABSENT	15	0.9	20/2.1	no	no	no	no	no	no	20	2.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	121	NEGATIVE	NEGATIVE	5.2	105/190	105	190	3.1	6.1	MODERATE ASCITES	GRADE2
72	72	53	51 to 60 years	MALE	6	5 to 10 days	EDEMA FEET,HEMETEMESIS,JAUNDICE	ALCOHOLIC	72	100/60	100	60	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	SOFT NON TENDER	8.5	7300	89000	ABSENT	18	1.4	22/2.0	no	no	no	no	no	no	22	2	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	124	POSITIVE	NEGATIVE	4.1	89/110	89	110	2.9	5.6	SLIGHT ASCITES	GRADE1
73	73	62	more than 60 years	MALE	8	5 to 10 days	IRRELEVANT SPEECH,JAUNDICE	NON ALCOHOLIC	88	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ALTERED SLEEP CYCLE	SOFT NON TENDER	12.1	9700	105000	ABSENT	17	1.3	11/1.8	no	no	no	no	no	no	11	1.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	129	POSITIVE	NEGATIVE	5.6	110/199	110	199	3.2	6.3	SLIGHT ASCITES	GRADE1
74	74	43	41 to 50 years	MALE	5	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	84	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	10.5	5600	120000	ABSENT	19	1.8	20/2.0	no	no	no	no	no	no	20	2	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	125	NEGATIVE	NEGATIVE	6.1	129/197	129	197	2	5.8	MODERATE ASCITES	GRADE2
75	75	48	41 to 50 years	MALE	7	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ALTERED SLEEP CYCLE	DISTENDED,ASCITES	11.2	7200	198000	ABSENT	17	0.6	22/2.3	no	no	no	no	no	no	22	2.3	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	3.8	204/287	204	287	1.8	6.3	MODERATE ASCITES	GRADE2
76	76	53	51 to 60 years	MALE	6	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	84	110/60	110	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	DISTENDED,ASCITES	10.6	8900	105000	ABSENT	19	1.4	18/2.1	no	no	no	no	no	no	18	2.1	IRREGULAR LIVER SURAFCE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	129	NEGATIVE	NEGATIVE	5.3	107/209	107	209	2.9	5.9	MODERATE ASCITES	GRADE2
77	77	61	more than 60 years	MALE	8	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	ALCOHOLIC	72	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ALTERED SLEEP CYCLE	DISTENDED,ASCITES	12.1	4700	201000	ABSENT	20	1.7	12/1.8	no	no	no	no	no	no	12	1.8	IRREGULAR LIVER SURAFCE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	124	NEGATIVE	NEGATIVE	4.8	209/287	209	287	2.9	6.1	MODERATE ASCITES	GRADE1
78	78	42	41 to 50 years	MALE	9	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	ALCOHOLIC	88	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11.2	8700	189000	ABSENT	14	1.3	16/2.1	no	no	no	no	no	no	16	2.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	5.1	187/206	187	206	3.1	5.9	MODERATE ASCITES	GRADE2
79	79	52	51 to 60 years	MALE	7	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	DISTENDED,ASCITES	10.3	9800	201000	ABSENT	17	1.1	16/1.8	no	no	no	no	no	no	16	1.8	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	126	NEGATIVE	NEGATIVE	4.6	200/245	200	245	2.9	6.3	MODERATE ASCITES	GRADE2
80	80	48	41 to 50 years	MALE	6	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	88	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	12.3	5600	117000	ABSENT	14	0.9	20/1.6	no	no	no	no	no	no	20	1.6	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	125	NEGATIVE	NEGATIVE	5.6	187/205	187	205	3.2	5.7	MODERATE ASCITES	GRADE2
81	81	61	more than 60 years	MALE	8	5 to 10 days	WEAKNESS,HEMETEMESIS,JAUNDICE	NON ALCOHOLIC	76	100/70	100	60	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	SOFT NON TENDER	8.7	7600	167000	ABSENT	18	1.6	16/1.6	no	no	no	no	no	no	16	1.6	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	121	NEGATIVE	NEGATIVE	6.1	200/276	200	276	2	6.1	SLIGHT ASCITES	GRADE2
82	82	57	51 to 60 years	MALE	6	5 to 10 days	JAUNDICE,WEAKNESS,VOMITING	NON ALCOHOLIC	88	120/80	12	80	ABSENT	ABSENT	PRESENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ALTERED SLEEP CYCLE	SOFT NON TENDER	12.7	6500	226000	ABSENT	10	1.1	11/1.6	no	no	no	no	no	no	11	1.6	NODULAR LIVER SURFACE,NO ASCITES	NODULAR LIVER SURFACE	NO ASCITES	138	NEGATIVE	NEGATIVE	3.8	187/200	187	200	3.8	6.8	NO ASCITES	GRADE1
83	83	62	more than 60 years	MALE	5	5 to 10 days	JAUNDICE,FEVER	ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	11.8	6700	306000	ABSENT	14	1.3	6/1.1	no	no	no	no	no	no	6	1.1	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	133	NEGATIVE	NEGATIVE	4.1	115/167	115	167	4.1	6.7	SLIGHT ASCITES	GRADE1
84	84	43	41 to 50 years	MALE	6	5 to 10 days	FEVER,WEAKNESS,DECREASE APPETITE	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	ABSENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	12.3	6400	230000	ABSENT	12	1.1	6/1.1	no	no	no	no	no	no	6	1.1	NODULAR LIVER SURFRACE,NO ASCITES	NODULAR LIVER SURFACE	NO ASCITES	136	NEGATIVE	NEGATIVE	2.8	120/165	120	165	3.8	6.7	NO ASCITES	ABSENT ENCEPHALOPATHY
85	85	51	51 to 60 years	MALE	5	5 to 10 days	WEAKNESS,VOMITING	NON ALCOHOLIC	76	120/80	12	80	ABSENT	ABSENT	ABSENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	11.8	5400	222000	ABSENT	17	1	4/1.1	no	no	no	no	no	no	4	1.1	NODULAR LIVER SURFACE,NO ASCITES	NODULAR LIVER SURFACE	NO ASCITES	141	NEGATIVE	NEGATIVE	2.3	89/101	89	101	4.2	6.3	NO ASCITES	ABSENT ENCEPHALOPATHY
86	86	53	51 to 60 years	FEMALE	8	5 to 10 days	EDEMA FEET,DROWSINESS	NON ALCOHOLIC	88	110/70	110	70	ABSENT	ABSENT	ABSENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	SOFT NON TENDER	10.7	4300	109000	ABSENT	14	1.6	18/2.3	no	no	no	no	no	no	18	2.3	NODULAR LIVER SURAFCE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	126	NEGATIVE	NEGATIVE	2	105/176	105	176	3.1	5.8	SLIGHT ASCITES	GRADE2
87	87	49	41 to 50 years	MALE	4	less than 5 days	JAUNDICE,DROWSINESS,ABDOMINAL DISTENSION	NON ALCOHOLIC	76	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11.1	6700	118000	ABSENT	20	1.5	20/2.1	no	no	yes	yes	no	no	20	2.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	121	NEGATIVE	NEGATIVE	6.3	200/287	200	287	2.3	5.8	MODERATE ASCITES	GRADE 3
88	88	59	51 to 60 years	MALE	3	less than 5 days	JAUNDICE,UNCONSCIOUS,ABDOMINAL DISTENSION	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	12.7	5400	145000	ABSENT	19	1.3	22/1.8	yeses	no	yes	yes	yes	no	22	1.8	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	127	NEGATIVE	POSITIVE	8.2	165/290	165	290	2.8	6.1	MODERATE ASCITES	GRADE 4
89	89	61	more than 60 years	MALE	8	5 to 10 days	JAUNDICE,DROWSINESS	ALCOHOLIC	76	120/80	112	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	SOFT NON TENDER	10.9	7800	201000	ABSENT	14	1	20/2.6	no	no	no	no	no	no	20	2.6	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	125	NEGATIVE	POSITIVE	5.3	110/198	110	198	3.2	5.6	SLIGHT ASCITES	GRADE 3
90	90	50	41 to 50 years	MALE	5	5 to 10 days	JAUNDICE,DROWSINESS,ABDOMINAL DISTENSION	NON ALCOHOLIC	84	110/76	110	76	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	9.8	4300	167000	ABSENT	18	1.6	22/3.6	no	yes	yes	yes	yes	yes	22	3.6	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	10.6	206/287	206	287	2	5.3	MODERATE ASCITES	GRADE 4
91	91	45	41 to 50 years	MALE	9	5 to 10 days	JAUNDICE,HEMETEMESIS	NON ALCOHOLIC	76	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	SOFT NON TENDER	10.6	7800	201000	ABSENT	14	1.1	18/1.8	no	no	no	no	no	no	18	1.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	127	NEGATIVE	POSITIVE	4.1	109/190	109	190	3.2	6.1	SLIGHT ASCITES	GRADE2
92	92	49	41 to 50 years	MALE	4	less than 5 days	JAUNDICE,ABDOMINAL DISTENSION,DROWSINESS	ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	9.8	5600	157000	ABSENT	11	1.4	20/2.8	yeses	no	yes	yes	no	no	20	2.8	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	121	NEGATIVE	NEGATIVE	15.2	298/201	298	201	3	5.4	MODERATE ASCITES	GRADE 4
93	93	59	51 to 60 years	MALE	3	less than 5 days	JAUNDICE,HEMETEMESIS,ABDOMINAL DISTENSION	ALCOHOLIC	76	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11	4300	201000	ABSENT	18	1.7	22/3.1	no	no	yes	no	yes	yes	22	3.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	119	NEGATIVE	NEGATIVE	8.6	354/254	354	254	3	6.1	MODERATE ASCITES	GRADE 3
94	94	45	41 to 50 years	MALE	8	5 to 10 days	FEVER,VOMITING,WEAKNESS	ALCOHOLIC	88	110/70	110	70	ABSENT	ABSENT	ABSENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	10	3800	243000	ABSENT	14	1.4	6/1.1	no	no	no	no	no	no	6	1.1	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	132	NEGATIVE	NEGATIVE	1.8	89/43	89	43	3.6	6.8	SLIGHT ASCITES	ABSENT ENCEPHALOPATHY
95	95	57	51 to 60 years	MALE	3	less than 5 days	JAUNDICE,EDEMA FEET,ALTERED SLEEP PATTERN	ALCOHOLIC	72	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	DISTENDED,ASCITES	11.1	7800	230000	ABSENT	17	1.5	16/3.0	no	no	no	no	no	no	16	3	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	14.2	345/126	345	126	1.8	5.3	MODERATE ASCITES	GRADE2
96	96	46	41 to 50 years	MALE	2	less than 5 days	JAUNDICE,HEMETEMESIS	ALCOHOLIC	88	110/70	110	70	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	9.7	6700	211000	ABSENT	20	1.1	14/1.8	no	no	no	no	no	no	14	1.8	NODULAR,IRREGULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	126	NEGATIVE	NEGATIVE	8.2	289/123	289	123	3.1	5.8	SLIGHT ASCITES	GRADE2
97	97	43	41 to 50 years	FEMALE	5	5 to 10 days	JAUNDICE,EDEMA FEET	NON ALCOHOLIC	84	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	10.3	7600	245000	ABSENT	18	1.4	24/2.1	no	no	yes	yes	no	no	24	2.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	8.2	233/167	233	167	1.8	6.7	MODERATE ASCITES	GRADE 3
98	98	56	51 to 60 years	MALE	4	less than 5 days	JAUNDICE.EDEMA FEET,DROWSINESS	NON ALCOHOLIC	76	110/76	110	76	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11.8	9800	320000	ABSENT	20	1.8	16/1.8	no	yes	yes	no	yes	yes	16	1.8	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	124	NEGATIVE	NEGATIVE	4.8	189/201	189	201	2.8	5.6	MODERATE ASCITES	GRADE 4
99	99	63	more than 60 years	MALE	9	5 to 10 days	FEVER,HEMETEMESIS	NON ALCOHOLIC	84	120/80	12	80	ABSENT	ABSENT	ABSENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	12.3	7800	235000	ABSENT	16	1.3	6/1.2	no	no	no	no	no	no	6	1.2	NODULAR LIVER SURFACE,NO ASCITES	NODULAR LIVER SURFACE	NO ASCITES	136	NEGATIVE	NEGATIVE	2.3	345/335	345	335	4.5	6.7	NO ASCITES	ABSENT ENCEPHALOPATHY
100	100	54	51 to 60 years	MALE	6	5 to 10 days	ABDOMINAL PAIN ,VOMITING	NON ALCOHOLIC	72	110/70	110	70	ABSENT	ABSENT	ABSENT	ABSENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	11.3	4500	167000	ABSENT	14	1	8/1.1	no	no	no	no	no	no	8	1.1	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	138	NEGATIVE	NEGATIVE	1.9	245/267	245	267	4.2	6.4	SLIGHT ASCITES	ABSENT ENCEPHALOPATHY
101	101	52	51 to 60 years	MALE	5	5 to 10 days	JAUNDICE,EDEMA FEET,ABDOMINAL DISTENSION	ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,CONFUSED	DISTENDED,ASCITES	11.2	9700	110000	ABSENT	17	1.1	5/3.1	no	no	no	yes	no	no	5	3.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	10.2	121/86	121	86	2.1	5.8	MODERATE ASCITES	GRADE 3
102	102	63	more than 60 years	MALE	4	less than 5 days	DROWSINESS,JAUNDICE	ALCOHOLIC	84	120/84	12	84	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	SOFT NON TENDER	8.9	4800	105000	ABSENT	19	0.8	11/5.0	no	no	no	no	no	no	11	5	IRREGULAR LIVER SURFACE,SLIGHT ASCITES	IRREGULAR LIVER SURFACE	SLIGHT ASCITES	125	NEGATIVE	NEGATIVE	7.6	156/101	156	101	2.4	6.2	SLIGHT ASCITES	GRADE2
103	103	48	41 to 50 years	FEMALE	7	5 to 10 days	JAUNDICE,EDEMA FEET,ABDOMINAL DISTENSION	NON ALCOHOLIC	88	110/80	110	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,INCOHERENT SPEECH	DISTENDED,ASCITES	10.8	6300	121000	ABSENT	16	1.3	11/3.8	no	no	yes	no	yes	yes	11	3.8	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	129	NEGATIVE	NEGATIVE	4.2	89/156	89	156	2.2	5.9	MODERATE ASCITES	GRADE 3
104	104	62	more than 60 years	MALE	3	less than 5 days	JAUNDICE,DROWSINESS,HEMETEMESIS	ALCOHOLIC	76	100/60	100	60	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	7.8	5800	95000	ABSENT	20	1.4	6/2.8	no	no	no	no	yes	no	6	2.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	122	NEGATIVE	NEGATIVE	5.4	88/143	88	143	1.8	6.2	SLIGHT ASCITES	GRADE 4
105	105	57	51 to 60 years	MALE	2	less than 5 days	JAUNDICE,DROWSINESS	NON ALCOHOLIC	72	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,CONFUSED	DISTENDED,ASCITES	10.7	4900	158000	ABSENT	17	0.8	8/2.6	no	no	yes	yes	no	yes	8	2.6	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	126	NEGATIVE	NEGATIVE	8.2	211/282	211	282	3.1	5.9	MODERATE ASCITES	GRADE 3
106	106	50	41 to 50 years	MALE	3	less than 5 days	JANDICE,DROWSINESS	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	DISTENDED,ASCITES	11.8	5200	143000	ABSENT	19	0.9	11/3.4	no	no	no	no	no	no	11	3.4	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	118	NEGATIVE	NEGATIVE	5	98/134	98	134	2.2	6.6	MODERATE ASCITES	GRADE2
107	107	41	41 to 50 years	MALE	5	5 to 10 days	JAUNDICE,EDEMA FEET,ABDOMINAL DISTENSION	NON ALCOHOLIC	84	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	10.2	8900	128000	ABSENT	20	1.3	8/2.1	no	no	yes	yes	yes	no	8	2.1	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	126	NEGATIVE	NEGATIVE	5.8	98/162	98	162	2.7	5.8	MODERATE ASCITES	GRADE 3
108	108	52	51 to 60 years	MALE	2	less than 5 days	EDEMA FEET,DROWSINESS	NON ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	11.2	5700	105000	ABSENT	17	0.7	9/1.8	no	no	no	no	no	no	9	1.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	129	NEGATIVE	NEGATIVE	3.8	89/110	89	110	2.6	6.1	SLIGHT ASCITES	GRADE 4
109	109	46	41 to 50 years	MALE	4	less than 5 days	JAUNDICE,DROWSINESS,ABDOMINAL DISTENSION	NON ALCOHOLIC	81	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	10.8	7200	181000	ABSENT	17	1	16/3.4	yeses	yes	yes	yes	yes	yes	16	3.4	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	121	NEGATIVE	NEGATIVE	8.4	181/230	181	230	3.1	6	MODERATE ASCITES	GRADE 4
110	110	61	more than 60 years	MALE	3	less than 5 days	JAUNDICE,EDEMA FEET,DROWSINESS	ALCOHOLIC	84	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	SOFT NON TENDER	11.4	4700	116000	ABSENT	18	1.1	11/2.8	no	no	no	yes	no	no	11	2.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	129	NEGATIVE	NEGATIVE	4.2	129/191	129	191	2.6	5.8	SLIGHT ASCITES	GRADE 3
111	111	49	41 to 50 years	FEMALE	4	less than 5 days	JAUNDICE,UNCONSCIOUS	NON ALCOHOLIC	88	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	10.8	6300	154000	ABSENT	20	0.9	8/2.7	no	no	no	no	yes	yes	8	2.7	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	125	NEGATIVE	NEGATIVE	11.2	340/430	340	430	3.1	6.3	MODERATE ASCITES	GRADE 4
112	112	43	41 to 50 years	MALE	3	less than 5 days	JAUNDICE,DROWSINESS,ABDOMINAL DISTENSION	NON ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	DISTENDED,ASCITES	11	5200	168000	ABSENT	17	1	16/2.7	yeses	yes	yes	yes	no	yes	16	2.7	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	118	NEGATIVE	NEGATIVE	6.2	123/209	123	209	1.8	5.8	MODERATE ASCITES	GRADE 4
113	113	54	51 to 60 years	MALE	6	5 to 10 days	JAUNDICE,DROWSINESS,EDEMA FEET	ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	10.4	8600	201000	ABSENT	19	1.4	14/2.3	no	no	no	no	yes	no	14	2.3	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	123	NEGATIVE	NEGATIVE	4.3	89/143	89	143	3.1	6.2	SLIGHT ASCITES	GRADE 4
114	114	43	41 to 50 years	MALE	4	less than 5 days	JAUNDICE,DROWSINESS,	ALCOHOLIC	84	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	11.4	9200	156000	ABSENT	20	1.3	16/1.8	no	no	no	yes	no	no	16	1.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	120	NEGATIVE	NEGATIVE	6.2	96/150	96	150	2.8	6	SLIGHT ASCITES	GRADE 4
115	115	51	51 to 60 years	MALE	5	5 to 10 days	ABDOMINAL DISTENSION,JAUNDICE,DROWSINESS	NON ALCOHOLIC	88	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	12.3	5600	134000	ABSENT	19	1.5	18/2.3	no	no	no	no	no	yes	18	2.3	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	129	NEGATIVE	NEGATIVE	8.9	201/240	201	240	1.6	5.9	MODERATE ASCITES	GRADE 3
116	116	54	51 to 60 years	MALE	6	5 to 10 days	ABDOMINAL DISTENSION,JAUNDICE,DROWSINESS	NON ALCOHOLIC	76	100/70	100	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11.8	6400	201000	ABSENT	20	1.1	18/3.2	yeses	yes	yes	yes	yes	yes	18	3.2	IRREGULAR LIVER SURFACE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	126	NEGATIVE	NEGATIVE	12.3	187/222	187	222	2.6	5.7	MODERATE ASCITES	GRADE 4
117	117	43	41 to 50 years	MALE	3	less than 5 days	JAUNDICE,DROWSINESS	ALCOHOLIC	84	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	COMATOSE	SOFT NON TENDER	12.1	5300	156000	ABSENT	19	1.4	16/2.8	no	no	no	no	no	no	16	2.8	IRREGULAR LIVER SURFACE,SLIGHT ASCITES	IRREGULAR LIVER SURFACE	SLIGHT ASCITES	123	NEGATIVE	NEGATIVE	6.2	123/270	123	270	1.8	6.2	SLIGHT ASCITES	GRADE 4
118	118	48	41 to 50 years	MALE	4	less than 5 days	FEVER,WEAKNESS,DECREASE APPETITE	ALCOHOLIC	76	110/60	110	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	SOFT NON TENDER	11.6	6400	230000	ABSENT	16	1.1	16/2.8	no	no	no	no	no	no	16	2.8	IRREGULAR LIVER SURFACE,SLIGHT ASCITES	IRREGULAR LIVER SURFACE	SLIGHT ASCITES	128	NEGATIVE	NEGATIVE	3.8	156/200	156	200	3.8	6.5	SLIGHT ASCITES	GRADE2
119	119	53	51 to 60 years	MALE	3	less than 5 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	83	100/60	100	60	ABSENT	ABSENT	ABSENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	DISTENDED,ASCITES	10.8	6500	158000	ABSENT	19	1.7	8/1.7	no	no	no	no	no	no	8	1.7	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	125	NEGATIVE	NEGATIVE	2.8	123/198	123	198	3.2	6.8	MODERATE ASCITES	GRADE2
120	120	58	51 to 60 years	MALE	8	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	80	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	DISTENDED,ASCITES	12.1	8600	201000	ABSENT	11	0.8	16/2.3	no	no	no	no	no	no	16	2.3	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	4.2	201/286	201	286	2.6	5.7	MODERATE ASCITES	GRADE2
121	121	63	more than 60 years	MALE	9	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	DISTENDED,ASCITES	10.8	4600	176000	ABSENT	15	0.9	20/2.1	no	no	no	no	no	no	20	2.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	121	NEGATIVE	NEGATIVE	5.2	105/190	105	190	3.1	6.1	MODERATE ASCITES	GRADE2
122	122	53	51 to 60 years	MALE	6	5 to 10 days	EDEMA FEET,HEMETEMESIS,JAUNDICE	ALCOHOLIC	72	100/60	100	60	PRESENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ASTERIXIS PRESENT	SOFT NON TENDER	8.5	7300	89000	ABSENT	18	1.4	22/2.0	no	no	no	no	no	no	22	2	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	124	NEGATIVE	NEGATIVE	4.1	89/110	89	110	2.9	5.6	SLIGHT ASCITES	GRADE1
123	123	62	more than 60 years	MALE	8	5 to 10 days	IRRELEVANT SPEECH,JAUNDICE	NON ALCOHOLIC	88	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ALTERED SLEEP CYCLE	SOFT NON TENDER	12.1	9700	105000	ABSENT	17	1.3	11/1.8	no	no	no	no	no	no	11	1.8	NODULAR LIVER SURFACE,SLIGHT ASCITES	NODULAR LIVER SURFACE	SLIGHT ASCITES	129	NEGATIVE	NEGATIVE	5.6	110/199	110	199	3.2	6.3	SLIGHT ASCITES	GRADE1
124	124	43	41 to 50 years	MALE	5	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	84	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	10.5	5600	120000	ABSENT	19	1.8	20/2.0	no	no	no	no	no	no	20	2	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	125	NEGATIVE	NEGATIVE	6.1	129/197	129	197	2	5.8	MODERATE ASCITES	GRADE2
125	125	48	41 to 50 years	MALE	7	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	ALCOHOLIC	76	110/70	110	70	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ALTERED SLEEP CYCLE	DISTENDED,ASCITES	11.2	7200	198000	ABSENT	17	0.6	22/2.3	no	no	no	no	no	no	22	2.3	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	3.8	204/287	204	287	1.8	6.3	MODERATE ASCITES	GRADE2
126	126	53	51 to 60 years	MALE	6	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	NON ALCOHOLIC	84	110/60	110	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,DISORIENTED TO TIME PLACE PERSON	DISTENDED,ASCITES	10.6	8900	105000	ABSENT	19	1.4	18/2.1	no	no	no	no	no	no	18	2.1	IRREGULAR LIVER SURAFCE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	129	NEGATIVE	NEGATIVE	5.3	107/209	107	209	2.9	5.9	MODERATE ASCITES	GRADE2
127	127	61	more than 60 years	MALE	8	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	ALCOHOLIC	72	100/60	100	60	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	CONSCIOUS,ALTERED SLEEP CYCLE	DISTENDED,ASCITES	12.1	4700	201000	ABSENT	20	1.7	12/1.8	no	no	no	no	no	no	12	1.8	IRREGULAR LIVER SURAFCE,MODERATE ASCITES	IRREGULAR LIVER SURFACE	MODERATE ASCITES	124	NEGATIVE	NEGATIVE	4.8	209/287	209	287	2.9	6.1	MODERATE ASCITES	GRADE1
128	128	42	41 to 50 years	MALE	9	5 to 10 days	ABDOMINAL DISTENSION,EDEMA FEET	ALCOHOLIC	88	120/80	12	80	ABSENT	ABSENT	PRESENT	PRESENT	NOT RAISED	S1S2 PRESENT	CLEAR AEBE	DROWSY,IRRELEVANT SPEECH	DISTENDED,ASCITES	11.2	8700	189000	ABSENT	14	1.3	16/2.1	no	no	no	no	no	no	16	2.1	NODULAR LIVER SURFACE,MODERATE ASCITES	NODULAR LIVER SURFACE	MODERATE ASCITES	128	NEGATIVE	NEGATIVE	5.1	187/206	187	206	3.1	5.9	MODERATE ASCITES	GRADE2