ORIGINAL RESEARCH

A PROSPECTIVE OBSERVATIONAL STUDY ON PATTERN OF COMORBID CONDITIONS IN CLD PATIENTS WITH DRUG USE PATTERN, AND ASSESSMENT OF SEVERITY USING MELD SCORE.

ARATHY. P. C, VISHAK MOHAN, AL-MUNEER. S, DHANYA. H*

Pharm.D, Department Of Pharmacy Practice, Sree Krishna College Of Pharmacy and Research Centre, Trivandrum, Kerala, India

Submitted on:28.12.16; Revised on: 20.01.16; Accepted on: 02. 02.16

ABSTRACT

Objective: The main objective of the study was to assess the pattern of co-morbidity, pattern of drug use in patients with chronic liver disease and assessment of severity using MELD score.

Methods: The study included a total of 70 patients who met the inclusion and exclusion criteria. The details of co-morbid conditions and drugs was collected from the case records and direct interview of the patients with the help of physician. Pattern of co- morbid condition and drug use pattern were assessed. The severity of liver disease was assessed using Model for End stage Liver Disease (MELD) score.

Results: Among the study population, diabetes and hypertension were the frequently observed co-morbid conditions. Hypothyroidism, anemia, dyslipidaemia and coronary artery disease were the other co-morbid conditions observed. Most commonly prescribed drugs were gastric acid suppressants, antibiotics, lactulose, hepatoprotectives and diuretics. The least prescribed drugs were probiotics and vitamin supplements. MELD score of the majority of the population were between 20- 29 with mortality rate of 20%.

Conclusion: Through this study we were able to find out the severity/ mortality rate among the patients enrolled in our study. Also the drug use pattern in CLD patients was studied and changes were made accordingly with the concern of the physician involved. Common co-morbid conditions associated with chronic liver disease were found out through direct observation.

KEYWORDS: Chronic liver disease (CLD), MELD score, Co-morbid conditions, Dyslipidaemia

Corresponding author: Dr. Dhanya. H
Email id: arathypc94@gmail.com

Indian Research Journal of Pharmacy and Science; 11(2016) 861-867;
Journal Home Page: https://www.irjps.in

INTRODUCTION

The liver is a vital organ[1]. It has a very wide range of functions such as detoxification, protein synthesis, and engenderment of biochemical, glycogen storage, decomposition of red blood cells and hormone production. Because of its strategic location and multidimensional functions, the liver is also prone to many diseases.

Cirrhosis is defined as a diffuse process characterized by fibrosis and a conversion of the normal hepatic architecture into structurally abnormal nodules[1]. Regardless of the mechanism of injury, the end result is the destruction of hepatocytes and their replacement with fibrous tissue. As fibrotic tissue replaces normal hepatic parenchyma, resistance to blood flow results in the clinical problems of portal hypertension and the development of varices and ascites. Hepatocyte loss and intrahepatic shunting of blood results in diminished metabolic and synthetic function, which leads to hepatic encephalopathy and coagulopathy[1].

CLD and co- morbidities

A co-morbidity is usually defined as a disease coexisting with disease of interest. Diabetes and cardiovascular (CVS) disorders are common co-morbidities associated with liver disease[6]. Patients with liver cirrhosis have inter-related co-morbidities with shared risk factors including hypertension, diabetes, dyslipidaemia, hypothyroidism, anaemia etc. that can worsen liver functions. Infection and sepsis were also associated co-morbidities in patients of liver disease[6]. Most patients with advanced liver cirrhosis have at least one co-morbidity.

Drugs used in CLD

The treatment of liver disease depends on the symptoms and individual condition of the patients. Assessment of drug use pattern help to determine the most commonly used drugs in CLD patients[3]. It helps to improve the drug use in liver disease[3].

The portal hypertension can be treated using beta blockers. Variceal bleeding can be treated with somatostatin analogues, vasopressin etc. Ascites can be treated with diuretics and paracentesis. Spontaneous bacterial peritonitis can be treated with antibiotics. Hepatic encephalopathy can be treated with lactulose, L- ornithin L- aspartate etc. Other drugs are vitamin supplements, hepatoprotectants, and gastroprotectants etc[1].

Assessment of disease severity

Prognostic models are useful for estimating disease severity and survival. It can serve as a helpful medical descision - making tool with respect to guiding patient care. A numerical scale, MELD score system was used for assessing the prognosis of the patients[8]. The Model for End stage Liver Disease (MELD) is aprospectively developed and validated chronic liver disease severity scoring system that uses a patient's laboratory values for serum bilirubin, serum creatinine and International Normalized ratio (INR) for prothrombin time to predict 3 month survival. Assessment of MELD score is used to know the severity of the disease and there by helps in improving the approaches to slow disease progression and prevent further complications[9].

MATERIALS AND METHODS

Study sight: Department of Gastroenterology, of 350 bedded cosmopolitan multispecialty hospital situated in Trivandrum.

Study period: Six months (December 2015-May 2016).

Study design: Prospective Observational study.

Study people:

Patients from the department of Gastroenterology in Cosmopolitan hospital who were diagnosed or had a history of Chronic Liver Disease during the study period, were included after obtaining the permission for collection of data and to accompany physician in Gastroenterology ward.

Inclusion criteria:

All the inpatients admitted in the department with chronic liver disease during the study period, Patients of age above 12 yrs, Patients with complete Medical Records, Patients who are willing to participate in the study.

Exclusion criteria:

Patients aged below 12 yrs, Patient with incomplete Medical records, Pregnant women, Patients not willing to participate in the study.

Sample Size:

Sample Size Calculation of mean in Descriptive study

$$N = \frac{Z\infty^2\ \sigma^2}{d^2}$$

Where $Z\infty$ = Z statistics for a level of confidence

σ = standard deviation of an attribute in the population
d = desired level of precision

Total 100 patients were included in the study.

Data collection

The relevant data were collected while accompanying the clinician 6 days in a week and also from inpatient medical records. All the information relevant to the study was collected by thorough search from the case records and by conducting interview with the patient and patient's care givers. Informed consent was obtained from the patient or the care givers voluntarily by obtaining signature from any one of them before the interview was conducted. The pattern of co-morbid conditions was assessed and the drug use pattern in the patients was also determined. All the patients included in the study were assessed using Model for End stage Liver Disease score (MELD).

The Institutional Ethics Committee of Cosmopolitan Hospital in its meeting held at Board room , reviewed and discussed the thesis protocol and was approved by the IEC committee.

Data analysis

The obtained cases were thoroughly analysed to evaluate the pattern of co- morbid conditions in CLD patients with drug use pattern, and assessment of mortality rate using MELD score. The final result is determined using Basic statistical analysis.

RESULTS

Gender Distribution

The study was conducted across 70 patients admitted in the Gastroenterology department. Out of 70 patients
53 (76%) of the study population was predominantly male and 17 (24%) of the patients were female.

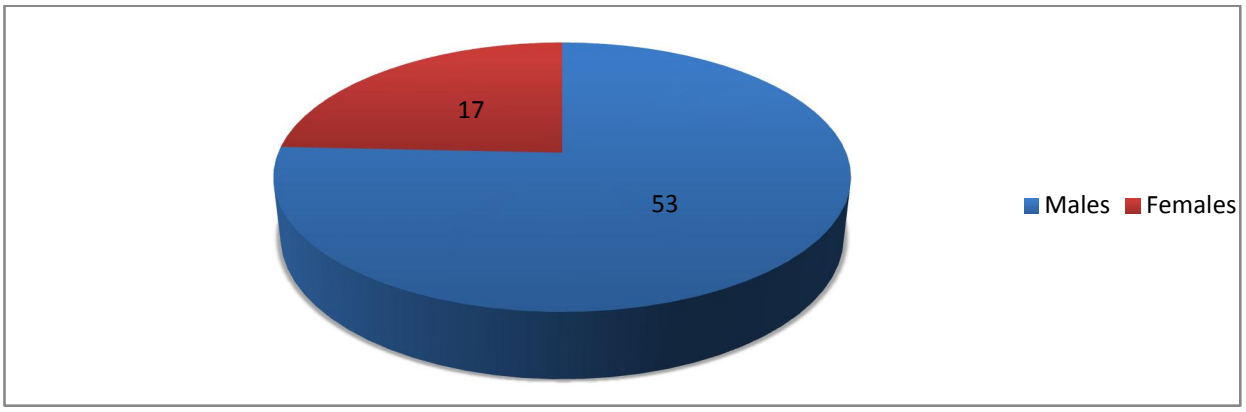

Figure 1. Graph showing distribution of the sample according to gender

Age Distribution

The age of the study population ranged between 30 to 91 years with a mean age of 11.66 years. Most of the patients (33%) were in the late adulthood (60-70yrs).

Sl. No	Age (Years)	(n=70)
1	30-40	3
2	41-50	11
3	51-60	14
4	61-70	23
5	71-80	15
6	81-90	4

Table 1. Distribution of the sample according to age

Pattern of Co-morbid condition

Among the study population of 70 patients 33 patients had Diabetes, 26 patients had Hypertension, 7 patients had Hypothyroidism, 6 patients had Anemia, 6 patients had Dyslipidaemia, 6 patients had Coronary artery disease, 3 patients had Hepatitis, 1 patient had gastropathy, and 1 patient had Cholelithiasis and 9 patients had other co-morbid conditions. In the study population 11 patients had both Diabetes and Hypertension.

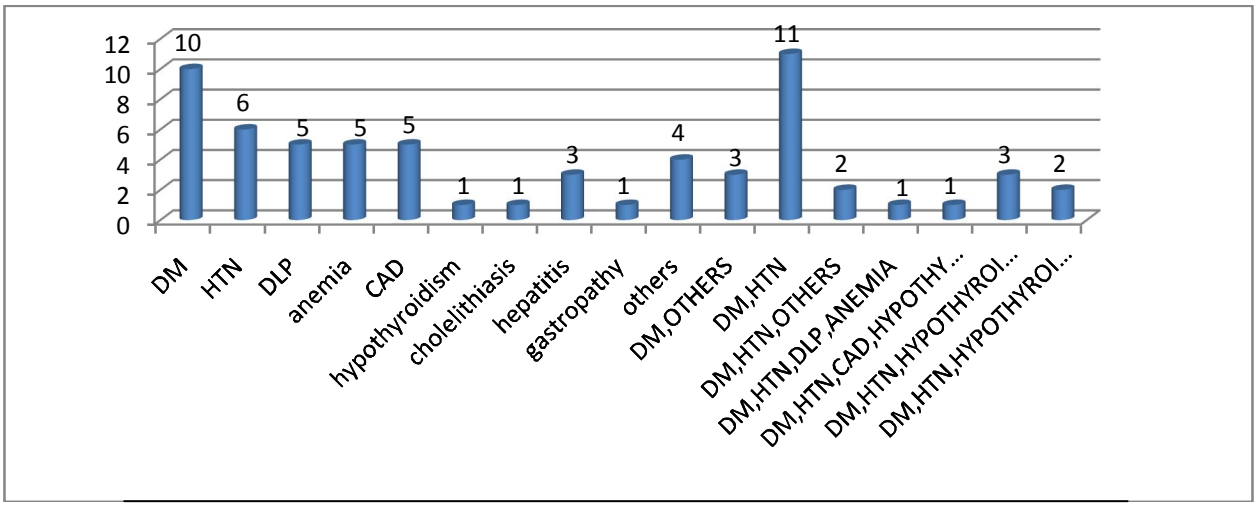

Figure 3. Graph showing pattern of co-morbid conditions in study population

Drug use pattern

A total of 458 drugs in 70 patients were evaluated in the present study. Among these 59 drugs were Gastroprotectants, 57 drugs were Antibiotics, 42 patients were given with Lactulose, 41 drugs were from other classes, 40 drugs were Hepatoprotectives, 34 drugs were Diuretics, Insulin was given to 30 patients and 25 patients were given with Rifaximine, 25 drugs were antihypertensives, 22 drugs were Vitamins, 17 drugs were Anticoagulants, 16 drugs were Antiplateletics, 14 drugs were oral hypoglycemic agents, 11 drugs were Probiotics, 7 drugs were Iron supplements, 6 drugs were hormone analoges , 4 drugs were antihyperlipidaemics, 3drugs were thyroid drugs and 3 drugs were protein supplements. Also 2 patients were prescribed with Tranexa and no NSAIDs were prescribed for the CLD patients.

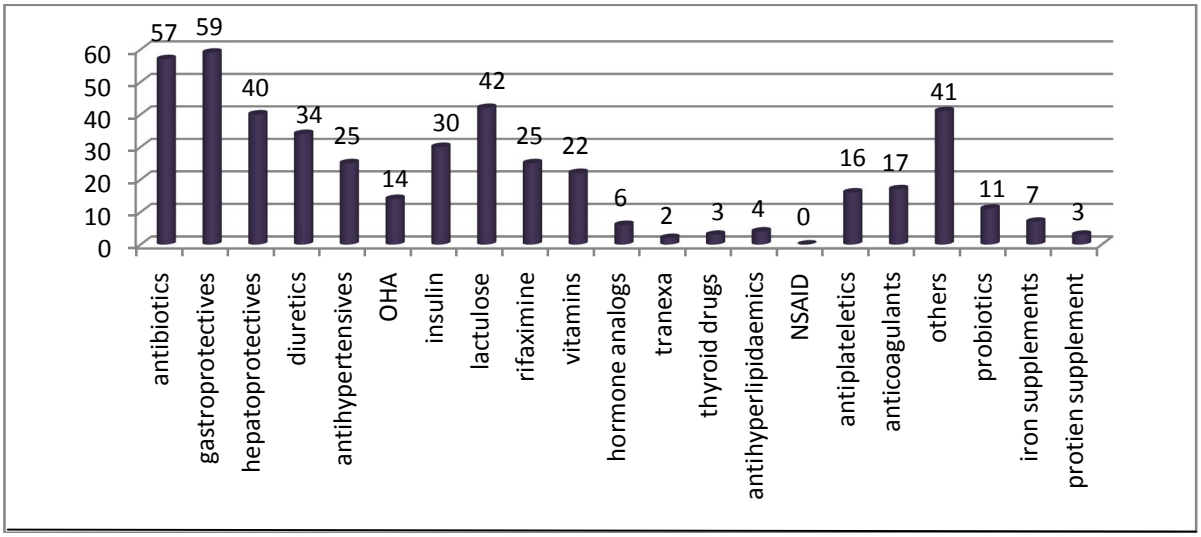

Figure 4. Graph showing pattern of drug use among study population

Disease severity

Among the study population of 70 patients, 32 patients had MELD score between 20 – 29, 16 patients had score between 10 - 19, 11 patients had score between 30 – 39, 6 patients had score above 40, and 5 patients had score below 10.

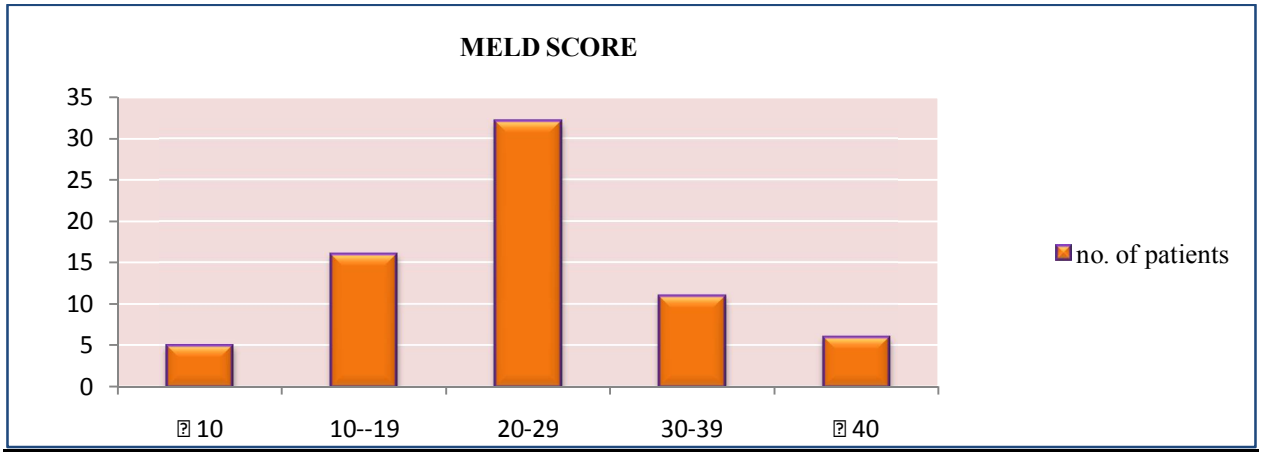

Figure 5: Graph showing distribution of the population based on MELD score

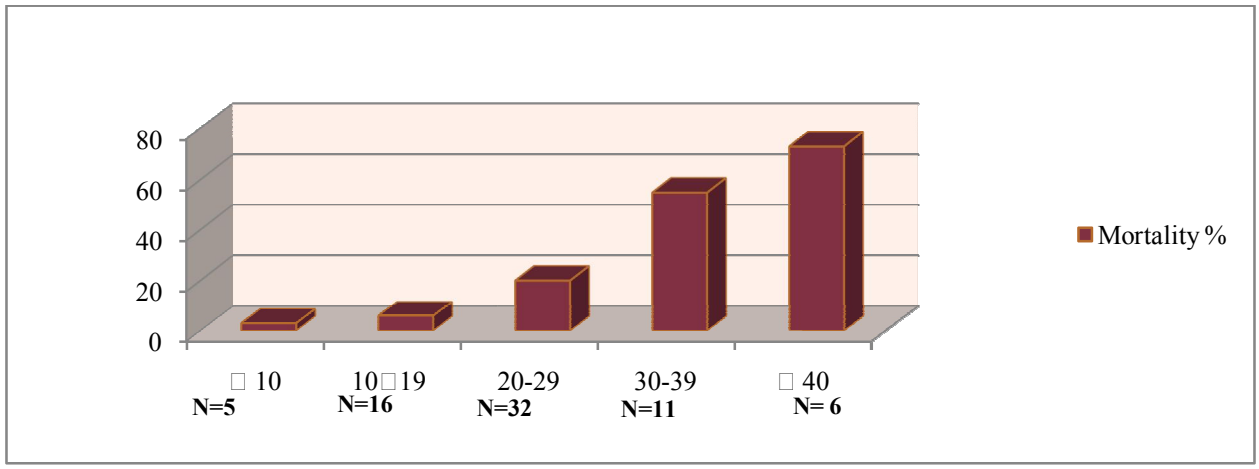

Figure 6. Graph showing 3 month mortality based on MELD score

DISCUSSION

The study highlights the pattern of co-morbid conditions in chronic liver disease patients, pattern of drug use in chronic liver disease, and assessment of severity of disease.

A total of 70 patients who satisfied inclusion criteria were enrolled for the study. Among the study subjects of 70 CLD patients, 53 (76%) of the study population was predominantly male and 17 (24%) patients were female. (fig. 1) Male patients may have greater susceptibility to CLD when compared to female subjects.

The age of the study population ranged between 30 to 91 years with a mean age of 11.66 years. It was also understood that most of the patients (33%) were in the late adulthood (60-70yrs). Only 4% of the patients were in the age group of 30-40yrs (Table No:1). The prevalence of CLD may increase with age as the liver size and blood flow decreases. The ability of liver to metabolise decreases with aging. Thus, some drugs are not inactivated as quickly in older people as they are in younger people. Also the ability of the liver to withstand stress decreases. Repair of damaged liver is also slower in older people. The production and flow of bile decrease with aging.

Diabetes mellitus, hypertension, dyslipidaemia, are common in liver cirrhosis patients and most patients with advanced liver cirrhosis have at least one co-morbidity. Patients with liver cirrhosis have inter-related co-morbidities with shared risk factors including hypertension, diabetes, dyslipidaemia, hypothyroidism, anemia, coronary artery disease, chronic kidney disease that can worsen liver functions.

A total of 458 drugs in 70 patients were evaluated in the present study. Gastroprotectants were the most commonly prescribed category of drugs. Among these , proton pump inhibitors were the most frequently used drugs in our subjects. Antibiotics were the next category that commonly prescribed to the study population. Among this, Cephalosporins were the most frequently used drugs. Lactulose and Rifaximine were the other drugs that frequently given to the patients. Hepatoprotectants were also a major class of drugs observed in the prescription for CLD patients. Among this, Ursodeoxycholicacid and L- Ornithin-L- aspartate were the commonly used drugs. Diuretics are the another main class of drugs given to the study subjects. In this Furosemide and Spironolactone were the commonly prescribed drugs and Torsemide was also prescribed to a lesser extent.

Among the study population of 70 patients, MELD score of 46% of the patients were between 20 -29 with expected 3 month mortality rate 20% and only 8% of the patients had MELD score above 40 with expected 3 month mortality rate above 70%. From the study only small number of patients were in severe condition. An increase in the MELD score is associated with a decrease in residual liver function.

CONCLUSION

The study was conducted to evaluate the pattern of co-morbid conditions, pattern of drug use, and assessment of severity using Model for End Stage Liver Disease Through this study we were able to find out the severity/ mortality rate among the patients enrolled in our study. Also the drug use pattern in CLD patients was studied and changes were made accordingly with the concern of the physician involved. The co-morbid conditions involved in CLD patients were found out through direct observation and case study of each patient enrolled which improved the knowledge among physicians and pharmacist; that has lead to individualising dosage regimen.

REFERENCE

1. Marie A Chisholm – Burns, Barbara G. Wells, Terry L. Schwinghammer, Patrick M. Malone, Jill M. Kolesar, John C. Rostschaffer, Joseph T. Dipiro, Portal hypertension and Cirrhosis, " Pharmacotherapy Principles and Practice",8th edition, New York, McGraw Hill Medical, 2012, 693 – 695.
2. Brian K. Alldredge, Robin L. Corelli, Michael E. Ernst, B. Joseph Gugliemlo, Pamala A. Jacobson, Wayne A. Kradjan, Bradley R. Williams, Koda-Kimble & Young's, Complications of End-stage liver disease, "Applied Therapeutics the Clinical Use of Drugs", 10th edition, Wolters Kluwer Lippincott Williams & Wilkins, Philadelphia, 2005, 721-725.
3. Meenu Vijayan, Anisha K A, Arjun Sanal Kumar Selina and Roshni P R " Clinical Profile and Prescribing Pattern of Cirrhosis in a Tertiary Care Hospital" , Indian Journal of Pharmacy Practice Sept 2014; 7(3): 69-73.
4. Anteneh Assefa Desalegn. Assessment of drug use pattern using WHO prescribing indicators at Hawassa University teaching and referral hospital, south Ethiopia. *School of Medicine, Hawassa University, Hawassa, Ethiopia* 2013; 6(2): 43- 49.
5. Vinayak S. Jamade, Anuradha Malik, Sambasiva Rao Kolatia,Dinesh Reddy and Mangala Lahkar, "Prescription pattern of drugs WHO prescribing indicators used in alcoholic liver disease patients in a tertiary care teaching hospital in North-eastern India". *International Journal of Pharma and BioSciences* Oct 2015; 6(1): 503-510.
6. Namratha A Desai, Kishan P Kotak, Snehal S Patel. Investigation on epidemiology and etiology of liver diseases and characterization of its association with various factors. *International Journal of Pharmacy*. Feb 2015; (4): 102- 106.
7. Azza El Sayed Abd El-Fattah Mansy. Documentation & Evaluation Of The Impact Of The Clinical Pharmacist's Role In The Pharmaceutical Care Of Cirrhotic Liver Patients With Ascites.*Department of Clinical Pharmacy Ain Shams University* 2012; 2(4)

8. Robert M. Merion, Robert A. Wolfe, Dawn M. Dykstra, Alan B. Leichtman, Brenda Gillespie, and Philip J. Held. "Longitudinal Assessment of Mortality Risk Among Candidates for Liver Transplantation" *Liver Transplantation*, Vol 9. Jan 2003; (4): pp 12-18.
9. F Botta, E Giannini, P Romagnoli, A Fasoli, F Malfatti, B Chiarbonello, E Testa, D Risso,G Colla, R Testa. "MELD scoring system is useful for predicting prognosis in patients with liver cirrhosis and is correlated with residual liver function: a European study". *International Journay of Pharmacy Practice* April 2003; 134-139
10. Hirra Tasneem, Huda Shahbaz and Bushra Ali Sherazi " Causes, management and complications of ascites: a review" *International Current Pharmaceutical Journal*, February 2015, 4(3): 370-377.

CONFLICT OF INTEREST REPORTED: NIL; SOURCE OF FUNDING: NONE REPORTED