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Research Article

A PROSPECTIVE OBSERVATIONAL STUDY ON AETIOLOGY, COMPLICATIONS AND DRUG RELATED PROBLEMS OF LIVER DISORDERS IN A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Liver Disease is mainly caused due to the Alcohol intake. Globally alcohol, drug induced liver disorders, hepatitis are the most common liver disorders finally leading to cirrhosis.The main aim of the study to Identify the Aetiology, Complications, Drug related problems and Therapeutics outcomes of the liver disorders among the patients of the general medicine department.To evaluate etiological factors involved in various liver disorders and liver diseases leading to cirrhosis. A hospital based, Prospective Observational study was carried out in general medicine in patient ward. According to the inclusion and exclusion criteria the patient were enrolled after obtaining their consent.During this period we found the 150 patients admitted in the general medicine ward were males 125(83.33%), females 25(16.66%). In our study majority of the patients belongs to the age groups 41-50(47%, 31.34%) Followed by 31-40(39%, 26%). Various Liver Disorders are found in our study were DCLD (58%), Viral Hepatitis (14%), Cirrhosis (13.33%), ALD (1.33%). Various aetiological factors were Alcohol, Smoking, Drug abuse, Idiopathic, Abdominal pain. The most common drugs were given to the patient was antibiotic. The study emphasizes the need to improve awareness of the patients on liver diseases to promote early diagnosis, alcohol abstinence and reduce mortality. Hence there is a need to increase the involvement of clinical pharmacist in designing appropriate therapeutic regimen along with other health care professionals, with the ultimate goal of preventing mortality due to liver disorders.

Keywords: Aetiology, Drug related problems, Complications, Interventions, Therapeutic outcome, Clinical pharmacist.

INTRODUCTION

Liver disorders were recognized as 2nd leading cause of mortality in India. So, it is important to identify liver disorders in early stages. The liver is the largest solid organ, the largest gland and one of the most vital organs that functions as a centre for metabolism of nutrients and excretion of waste metabolites. Its primary function is to control the flow and safety of substances absorbed from the digestive system before distribution of these substances to the systemic circulatory system[1].

A total loss of liver function could leads to death within minutes, demonstrating the liver‘s great importance , view of this, this study was undertaken to review the physiology of the liver With a view to keep it functioning at its optimum and maintaining good health so as to avoid liver damages such as fatty liver, liver fibrosis and cirrhosis[1].

Cirrhosis of the liver is the end stage of chronic liver disease. Among the many liver disorders that can lead to cirrhosis, some progress rapidly (years) and others more slowly (decades). In Germany, cirrhosis is often a consequence of fatty liver disease due to alcoholism or other causes, but can also be caused by hepatitis B and hepatitis C. Cirrhosis is more common in overweight persons and smokers. The underlying causes of cirrhosis determine its rate of progression and are the focus of preventive efforts and treatment.[2]

There are several conditions that are diagnosed with liver disease. However, the damage to the liver follows a consistent pattern from the initial stages to advanced stages of the disease. When the liver is diseased, one or more but not necessarily all of the functions are impaired. There can be no test for liver functions as a whole. The various Liver Function Tests (LFTs) are tests of derangements of individual functions of the liver. Since many tests give many similar abnormal results in a particular liver disease, it may be possible to extend a conclusion drawn from single test[1].

Although infection with HBV or HCV and heavy alcohol use are well known risk factors for CLD and liver cancer, a significant proportion of cases (15% to 50%) do not present with these risk factors. Other risk factors for CLD include obesity and diabetes, and the proposed mechanism is through the development of NAFLD and non-alcoholic steatohepatitis (NASH) [3].

Hepatic failure is life-threatening because with severely impaired liver function, patients are highly susceptible to failure of multiple organ systems. Thus, respiratory failure with pneumonia and sepsis combine with renal failure to claim the lives of many patients with hepatic failure. A coagulopathy develops, attributable to impaired hepatic synthesis of blood clotting factors II, VII, IX, and X. The resultant bleeding tendency can lead to massive gastrointestinal bleeding as well as petechial bleeding elsewhere. Intestinal absorption of blood places a metabolic load on the liver, which worsens the extent of hepatic failure. The outlook of full-blown hepatic failure is grave: A rapid downhill

course is usual, death occurring within weeks to a few months in about 80% of cases[4].

In most cases, there is no effective treatment other than stopping the drug and providing general supportive care[5]. The Incidence of the Drug Induced Liver Disease [DILD] has continued to rise steadilysince 1960.It is not a life threatening[6].

CAUSES OF LIVER DISEASE

1]Infection-hepatitis virus Problems in the immune system-auto immune hepatitis, primary biliary cirrhosis
2] Genetics
3]Cancer and other growths
4]Chronic alcohol abuse
5]Drug induced liver damage
6]Fat accumulation in the liver[1].

RISK FACTORS

1]There are many risk factors which are responsible for liver disease among which alcohol is the primary cause followed by various infections, drugs etc.
2]People with following risk factors are more prone to develop diseases
3] Excess alcohol intake
4]Shared needles for injections
5]Exposure to an infected persons blood and body fluids
6]Unprotected sex
7] Exposure to harmful chemicals or toxins
8]Underlying medical conditions like diabetes, obesity etc.[1]

TYPES OF LIVER DISEASES: VIRAL HEPATITIS

Hepatitis literally means inflammation of the liver. It is caused by the hepatitis viruses, hepatitis A, B, C, D and E. hepatitis A and B are preventable by vaccines. Hepatitis A is often mild and patients usually[1, 7].

COMPLICATIONS OF LIVER DISORDERS

1] Swelling and accumulation of fluids in the abdomen
2]Bruising and bleeding in liver
3] Portal hypertension
4]Enlarged spleen
5] Jaundice
6]Hepatic encephalopathy
7]Insulin resistance and type 2 diabetes
8]Liver cancer

Hepatic injury is considered predictable from overdoses of acetaminophen (also called phenacetin or paracetamol) and exposure to Amanita phalloides toxin, carbon tetrachloride, and, to a certain extent, alcohol.

However, individual genetic differences in the hepatic metabolism of xenobiotics through activating and detoxification pathways play a major role in individual susceptibility to "predictable" hepatotoxins. Many other xenobiotics, such as sulphonamides, α-methyldopa, and allopurinol, cause idiosyncratic reactions[4].

International normalized ratio (INR) and platelet count are used to evaluate the bleeding risk in patients undergoing liver biopsy .INR this is ratio of prothrombin test over prothrombin control raised to the power of international sensitive index (ISI) These Biochemistry laboratory investigations are also used for the prediction of bleeding during laparoscopic procedures in patients with liver cirrhosis[8]

TREATMENT

Aim for high protein, high calorie diet, Reduce protein slowly if encephalopathic, Restrict dietary salt if ascites is present, Give vitamin K (Phytomenadione) 10mg slow IV injection over 3 - 5 minutes[1].

CLINICAL PHARMACIST INTERVENTIONS

An intervention which results in the correction of a prescribing/transcribing error or the provision of pharmaceutical advice which optimizes patient care.

TYPES OF INTERVENTIONS

1)Untreated condition
2)Adverse drug reaction
3)Improper drug selection
4)Sub therapeutic dose/under dose
5)Failure to receive medication
6)Overdose
7)Drug interactions
8)Medication adherence
The pharmacist's role has evolved over time, moving from traditional medication dispensing to involvement in direct patient care to the delivery of pharmaceutical care with a focus on enhancing medication appropriateness and preventing drug related problems.

UNDERLYING FACTORS

1] Old age
2] Polypharmacy
3] Genetic factors
4] Hepatic or renal diseases
5] Drug dependent factors

CONSEQUENCES OF DRUG RELATED PROBLEMS

1)Increased hospital admission /hospital stay
2)Increased health care expenditure
3) Loss of work and /or income
4)Decreased quality of life and Increased morbidity and mortality

CHILD-VPUGH SCORE

The initial version of Child, or Child-VTurcotte score, included two continuous variables (bilirubin and albumin) and three discrete (quantitative) variables (ascites, encephalopathy and nutritional status).Patients whose individual values fall into different groups could not be categorized. Therefore, variables have been ascribed 1, 2 and 3 points according to whether their values fell within the limits of groups A, B and C, respectively.

Table 1: Child Pugh Score

Factor	1 Point	2 Point	3 Point
Total Bilurubin (µmol/L)	<34	34-50	>50
Serum Albumin(g/L)	>35	28-35	<28
PT INR	<1.7	1.71-2.30	>2.30
Ascites	None	Mild	Moderate to Severe
	Class A	**Class B**	**Class C**
Total points	5-6	7-9	10-15
1 Year survival	100%	80%	45%

MATERIALS AND METHODS

Study site: Sri Venkateswara Ramnarayan Ruia Government General Hospital-SVRRGGH, Tirupati ,Andhra Pradesh, General Medicine Inpatient Department.

Study Design: A Hospital Based Prospective Observational Study.

Study Period: 6 months (November 2018 to April 2019)

Sample size: 150 patients

Inclusion criteria

Patients of both sexes with age group 21-90 years who are admitted with liver disease in the general medicine department.

- Patients who are willing to participate in the study.
- Patients with or without co-morbid condition.

Exclusion criteria

Excluded seriously ill and patients unable to communicate.

- Patients unwilling to participate in the study.
- Outpatients and Paediatric patients.

Study design and Method of data collection

Our study was a hospital based prospective observational study which was conducted in inpatient general medicine. Age group between 21- 90 years who were diagnosed with the liver disorders admitted in the in-patient wards of general medicine at Sri Venkateswara Ramnarayan Ruia Government General Hospital-SVRRGGH, Tirupati , Andhra Pradesh, between November 2018- April 2019 were included in the study. Patients admitted only for observation were excluded in the study.

A specially designed proforma was used for collecting data which includes patient demographics, past medical history, co-morbidities, drug related problems, diagnosis and present medication prescribed. From each patient the data is obtained by direct patient interview and from patient case profiles. All in patients cases in general medicine ward was screened for liver disorders.

Patients who visited the inpatient general medicine department were considered according to the inclusion and exclusion criteria for a period of 6 months.

The collected data was analysed for aetiology, complication, and drug related problems, and treatment outcome of liver disorders. Drug interaction was checked using the Micromedex. Naranjo assessment scale used to check the severity of ADRs.

Study materials: Data Collection form, Micromedex solutions, Naranjo scale.

Ethical committee approval: Approval number – SPSP/2018-2019/PB02.

Statistical analysis: It was performed by using Microsoft office Excel 2013 for analysing the results in the form of charts and tables.

RESULTS

A total of 150 patients admitted in general medicine department of a tertiary care teaching hospital with the diagnosis of liver disorders for a period of 6 months.

Table 2: Gender wise distribution among patients

Gender	No of Patients (n=150)	Percentage (%)
Males	125	83.33
Females	25	16.66

Out of 150 Study Population, Males constituted the major portion i.e., 125 (83.33%) followed by Females 25 (16.66%) patients.

Table 3: Age wise distribution among patients

Age (years)	Number of Patients (n=150)	Percentage (%)
21-30	16	10.66
31-40	39	26
41-50	47	31.33
51-60	28	18.66
61-70	11	7.34
71-80	8	5.33
81-90	1	0.66

In our study majority of liver disorder patients belongs to the age group between 41-50 (47, 31.33%), followed by 31-40 (39, 26%), 51-60 (28, 18.66%), 21-30 (16, 10.6%) patients respectively.

Table 4: Various types of liver disorders

Disease	No Of Patients (n=150)	Percentage (%)
DCLD	87	58
Viral hepatitis	21	14
Cirrhosis	20	13.33
CLD	20	13.33
ALD	2	1.33

Out of 150 patients, 58% are affected with Dcld (87), 13.33% are affected with Cld (20), 14% Viral hepatitis (21), 13.33% Cirrhosis (20) and1.33% Ald (2) respectively.

Table 5: Various aetiological factors

Aetiological Factors	No Of Patients (n=150)	Percentage (%)
Alcohol	91	54.81
Smoking	25	15.06
Viral hepatitis	23	13.85
Idiopathic	15	9.03
Drug abuse	7	4.21
Obesity	3	1.80
Abdominal TB	2	1.20

Out of 150 patients, the prevalence is caused in the most of the liver disorder are by taking the excessive Alcohol 91 (54.81%) intake followed by Smoking 25(15.06%), Viral hepatitis 23(13.85%), Idiopathic 15(9.03%), Drug abuse 7(4.21%), Obesity 3(1.08%), and least is Abdominal TB 2(1.02%).

Table 6: Child pugh score

Class	No Of Patients (n=150)	Percentage (%)
A	44	29.33
B	79	52.66
C	27	18

Out of the total 150 patients the Child Pugh score classification Class B 79 (52.66%) was more followed by Class A 44 (29.33%) and Class C 27 (18%).

Table 7: Various complications in liver disorders

Complications	No Of Patients (n=150)	Percentage (%)
Ascites	83	31.20
Portal Hypertension	67	25.18
Dilated veins	25	9.39
Bleeding Manifestations	10	3.75
Pleural effusion	8	3.0
Oesophageal Varices	7	2.63
Sbp	6	2.25
Anaemia	5	1.87
Buddchiari syndrome	5	1.87
Encephalopathy	5	1.87
Liver Malignancy	3	1.12
Portal vein thrombosis	2	0.75
Neuropathy	1	0.37
Pvd	1	0.37
Jaundice	4	1.50
No complications	34	12.7

In our study Out of 150 study population, No complications are 34(12.7%) and the highest number of complication are found to be Ascites 83(31.20%) followed by Portal hyper tension 67(25.18%) and less complication are Sbp 6(2.25%), Budd-Chiari syndrome 5(1.87%), Portal vein thrombosis 2(0.75%) and Pvd 1(0.37%).

Table 8: Different class of drugs used among patients

Classes	No Of Patients (n=150)	Percentage (%)
Antibiotics	140	15.26
Vitamins	147	16.03
Diuretics	145	15.81
PPI's	127	13.84
Anti-Emetics	35	3.81
β-blockers	36	3.92
Laxatives	66	7.19
Antihistamines	12	1.30
Benzodiazepines	29	3.16
Analgesics	49	5.34
Anti-fungal	4	0.43
Proteolytic agents	2	0.21
Hepato-protectants	96	10.4
Anti-convulsants	4	0.43
Bronchodilators	7	0.76
Xanthene's	5	0.54
Corticosteroids	4	0.43
Hypoglycaemic	9	0.98

Out of the total 150 patients highly prescribed are Vitamins 147 (16.03%) followed by Diuretics 145 (15.81%), Antibiotics 140 (15.26%), PPI'S 127(13.84%) and other drugs.

Table 9: Different type of antibiotics among patients

Category	No of Patients (n=140)	Percentage (%)
Cephalosporin's	87	62.14
Penicillin	34	24.28
Quinolone	10	7.17
Tetracycline's	6	4.28
Macrolide	3	2.14

Among of 140 patients, cephalosporin 87(62.14%) antibiotics are highly prescribed, followed by penicillin 34(24.28%), quinolone 10(7.17%), tetracycline 6(4.28%) and macrolide 3(2.14%) antibiotics respectively.

Table 10: Different antibiotics prescribed among patients

Drugs	No Of Patients (n=140)	Percentage (%)
Cefotaxime	49	35
Ceftriaxone	38	27.14
Pipertz	19	13.37
Augmentin	15	10.7
Doxycycline	6	4.28
Ciprofloxacin	6	4.28
Norfloxacin	4	2.85
Azithromycin	3	2.14

Out of 140 prescriptions with antibiotics cefotaxime 49(35%) is mostly prescribed followed by ceftriaxone 38(27.14%), piper TZ 19(13.57%), Augmentin 15(10.7%) and other drugs.

Table 11: Drug related problems

Drug Related Problems	No Of Patients (n=150)	Percentage (%)
Untreated conditions	56	26.66
Improper drug selection	13	6.1
Failure to receive drugs	24	11.42
Sub therapeutics effects	12	5.71
Over dose	26	12.28
Adverse drug reactions	10	4.76
Drug interactions	45	21.42
Drug without indication	17	8.09
Drug related problem not found	7	3.33

Our study revealed that Out of 150 patients, Untreated condition (56) was the major drug related problem (26.66) followed by Over dosage 26(12.28%), Failure to receive drugs 24(11.42%), Drug interactions 45(21.42%), Drug without indication 17(8.09%), Sub therapeutic effects 12(5.71%). ADRs 10(4.76%), Improper drug selection 13(6.1%), Drug related problem Not found 7(3.33%).

Table 12: Drug-drug interactions in prescriptions

Drug Interactions	Severity	Effects
Norflox+Prolol	Moderate	Increased prolol exposure
Prolol+Furosemide	Moderate	Results in hypotension and bradycardia
Norflox+Calcium	Moderate	Results in decreased oral norflox efficacy
Propranolol+Lasix	Moderate	Result in decreased heart rate
Ceftriaxone+lasix	Moderate	Result in kidney problem
Pantop+Lasix	Moderate	Result in decreased pantop efficacy
Furosemide+Lactulose	Moderate	Result in dehydration
Propranolol+Furosemide	Moderate	Result in hypotension and bradycardia
Pantop+Prolol	Moderate	Result in prolol exposure
Prolol+Metformin	Moderate	Result in hypo or hypertension
Sucralfate+lasix	Moderate	Result in decreased natriuetics
Phenytoin+Metrogyl	Moderate	Result in increased phenytoin exposure
Glimipride+Furosemide	Moderate	May result in risk of hyperkalemia
Propranolol+Lasix	Moderate	Results in hypotension and bradycardia
Lasix+Pantop	Moderate	Results in decreased effectiveness of pantop
Phenytoin+Midazolam	Moderate	Results in alteration in serum concentration
Phenytoin+Midazolam	Moderate	Results in decreased efficacy of librium
Cifran+Sucralfate	Moderate	Results in decreased oral cifran effectiveness
Insulin+Metformin	Moderate	Results in increased hypoglycaemia
Glimipride+Insulin	Moderate	Results in increased hypoglycaemia
Rifampicin+Propanolol	Moderate	Results in decreased propranolol effectiveness
Pantop+Fluconazole	Moderate	Results in increased plasma concentration of CYP2 substrate
Fluconazole+Prednisalone	Moderate	Results in exposure risk for toxicity
Furosemide+Cefoperazone	Moderate	May results in nephrotoxicity
Pantop+Furosemide	Moderate	May results in increased plasma concentration
Azithromycin+Theophyline	Moderate	Results in increased risk of myopathy
Clopidrogel+Atrovastatin	Moderate	May result in increased serum concentration
Phenytoin+Lasix	Major	Results in decreased lasix efficacy
Phenytoin+Sucralfate	Major	May results in increased serum concentration
Aspirin+Metformin	Major	Results in increased risk of hypoglycaemia
Aspirin+Spiranolactone	Major	Results in decreased dieuretics effectiveness
Telmisartan+Spiranolactone	Major	May result in increased risk of effectiveness
Librium+Midazolam	Major	May result in increased risk of hypoventilation
Cifran+Metrogyl	Major	Results in increased QT intervals prolongation
Tenofovir+Rifampicin	Major	Results in decreased loss of therapeutics effects
Sulfamethazole+Fluconazole	Major	Results in increased risk of cardiac toxicity
Trimethoprim+Fluconazole	Major	Results in increased risk of cardiac toxicity
Potassium+Spiranolactone	Major	Result in hyperkalaemia
Aspirin+Furosemide	Major	May result in decreased dieuretics effectiveness
Aspirin+Spiranolactone	Major	Results in decreased hyperkalaemia
Atrovastatin+Fluconazole	Major	Results in increased myopathy
Fluconazole+Tramadol	Major	May results in tramadol exposure
Albendazole+Theophylline	Major	May altered theophylline concentration
Furosemide+Theophylline	Major	May altered theophylline concentration

Table 13: Severity of drug-drug interactions

Severity	No of Drug Interactions(n=45)	Percentage (%)
Moderate	27	60.00%
Major	18	40.00%

Out of the 150 patients, 27 Moderate (60%) and 18 Major Drug Interactions (40%) were found respectively.

Table 14: Adverse drug reactions

Drug	Adverse drug reactions
Pregabalin	Induced mucle ache
Rifoximine[2]	Induced abdominal discomfort
Aldactone[2]	Gynacomastia
Tramadol	Sob
Diazepam	Ataxia
Enalapril	Cough
Metrogyl	Rashes,Loose stools
Furosemide[2]	Induced Hypokalaemia
Rifagut	Abdominal ulcer
Cefperazone+salbactum	Loose stools

Table 15: Treatment outcome

Treatment Outcome	No of Patients (n=150)	Percentage (%)
Recovered	34	22.6
Not recovered	116	77.3

Out of total 150 patients not recovered 116 (77.3%) are more than the recovered 34(22.6%) patients.

DISCUSSION

Over the world, liver disease is the most common disease which may involve many pathological patterns. According to NHS there are over 100 types liver disorders which were recognized as second leading cause of mortality in India. Global prevalence of cirrhosis is 4.5 to 9.5% of general population this is because cirrhosis is likely to be estimated as almost 3/4th patients remains asymptomatic until their liver is irreversibly damage, and many drug related problems were also raised during the treatment of various liver disorders. A prospective observational study was carried out for 6 months in general medicine department inpatient ward of SVRRGGH hospital.

A total of 150 patients were included in this study. Among total study population 125(83.33%) patients were males and 25(16.66%) patients were females. This reveals that majority of male population were prone to liver diseases when compared to females. This may be due to higher consumption of alcohol is most seen in males than females, in Indian scenario. These findings are similar to[9].

In the present study more number of patients were seen between the age of 41-50 years (47 patients, 31.33%), followed by 31-40 years(39 patients, 26%), 51-60 years (28 patients,18.66%), this may be due to more stress full life will be more in between 31-50 years of age groups. Excessive alcohol consumption, urban environmental factors and socio economic factors are also play a key role for the occurrence of liver diseases, which is similar to[9].

Among the study population the most common liver disorders we observed was decompensated chronic liver disease 87 (58%) followed by chronic liver disease 20 (13.33%), viral hepatitis 21 (14%), cirrhosis 20 (13.33%), alcoholic liver disease 2 (1.33%). We observe many cirrhosis patients in our study who are in critical conditions without any alternative treatment regimen except liver transplantation. This is because majority of patients were not diagnosed and treated until their liver damage up to cirrhotic stage [10]. As liver is capable to maintain its normal activity even it is partially damage.

More than 75% of liver tissue needs to be affected before considerable decrease in liver function occurs. This may be the reason for long standing untreated liver disease causing irreversible damage to liver i.e., cirrhosis[9]. In present study the major etiological factors involved in causing liver disease is alcohol consumption (91,54.81%) followed by smoking (25,15.06%) and viral hepatitis (23,13.85%).9.03% of study population were suffering from Idiopathic liver disease that is because of unknown etiology. 4.21% patients were observed with liver failure with liver failure because of drug abuse particularly NSAIDS. Obesity is considered as risk factor only in 3 patients. The duration of alcohol consumption doesn't affect the progression of liver disease, where quantity of alcohol intake may increases the severity of liver disease. The national institute on alcoholic abuse and alcoholism defines safe daily intake of alcohol shouldn't be more than two drinks (1 drink=11-14gms of alcohol). Alcohol induced liver disease involves various pathological mechanisms like altered fat metabolism , oxidative stress, lipid peroxidation, formation of immunological adducts, release of cytokines finally leads to necroinflammation (or) apoptosis of hepatocytes[10,11,12].

In our study 23 patients were suffering with hepatitis B & C infection ,some of these cases were progressed to cirrhotic stage because of in appropriate therapy. NSAID induced liver disorder was observed in 7 patients which is due to reactive metabolites produced by NSAID metabolism which directly causes hepatic necrosis. Only 3 patients have obesity as a risk factor, it is due to steatohepatitis. These findings were in contrast with the study conducted by[2], in which hepatitis is the leading cause of liver damage.

Out of 150 study population 13.33% were suffering with an end stage liver disease with irreversible damage and poor prognosis with many complications this is because most of the patients in our study population were not aware of signs and symptoms of early stage liver disorders and they are not willing to quit alcohol until their signs and symptoms progressive to cirrhosis Most common complication was portal hypertension 67 (25.18%), followed by ascites 83 (31.20%), jaundice 4 (1.50%), bleeding manifestations 10 (3.75%) and rare complications include oesophageal Varices 7 (2.63%), liver Malignancy 3 (1.12%), pleural effusion 8 (3.0%), Budd-Chiari syndrome 5 (1.87%), portal vein thrombosis 2 (0.75%), PVD 1 (0.37%), SBP 6 (2.25%)[10,3,13]. 34 patients were observed with no complications. These complications were due to altered liver functional status i.e., changing in osmotic gradient results in ascites; increased pressure in the portal vein may lead to oesophageal and abdominal varices. Altered liver capacity to convert ammonia to urea may result in hepatic encephalopathy.

Decreased liver synthesis of various coagulation factors will results in bleeding manifestations [14] in which they observe the patients with hepatic encephalopathy. Next to vitamin supplements antibiotics are mostly prescribed drugs i.e., (140) to decrease the progression of infection followed by diuretics (145), to remove the water content from the body because in liver disorder ascites was commonly seen due to alterations in osmotic concentration gradient and other drugs includes lactulose for hepatic encephalopathy, beta blockers for portal hypertension, anti-emetics and proton pump inhibitors to reduce vomiting and gastric irritation, hepato protectants to reduce the progression of the disease[15,13].

Among 140 patients prescribed with antibiotics Cephalosporin's (87) was mostly prescribed because cephalosporins are well tolerated, easily available and safe antibiotic when compared to other categories. Physician should be aware of the risk of hepato-toxicity associated with the cephalosporin's 87 (62.14%) followed by the penicillin's 34 (24.28%) quinolones 10 (7.17%) and Macrolide 3 (2.14%).other drugs are Hypoglycaemic 9 (0.98%), Bronchodilator 7 (0.76%) prescribed to patients who has dyspnoea and other respiratory disorders. Xanthene's 5 (0.54%), corticosteroids 4 (0.43%) and anticonvulsants 4 (0.43%) are prescribed to patients. Macrolides are the least prescribed due to high hepatotoxicity[16, 17, 14].

Among the total (150) patients, untreated indication 56 (26.66%) was the major drug related problem followed by over dosage 26 (12.28%), failure to receive drugs 24 (11.42%), drug interactions (45.21.42%), improper drug selection 13 (6.1%), drug without indication 17 (8.09%), sub therapeutic doses 12 (5.71%), ADR 10 (4.76%) and not found 7 (3.33%). Drug related problems were also the serious concern in case of treating hepatic disorders because majority of drugs undergoes hepatic metabolism and may cause serious consequences in altered metabolic status of liver failure patients. Untreated indication, failure to receive drugs may results in progression of disease to cirrhosis stage, drugs without indication, over dosages, wrong drug may results in further decrease in liver function[18].

Out of the 150 patients 10 patients are developed ADR'S. The drugs caused ADR's are Pregabalin, Rifaximine, Aldactone, Tramadol, Diazepam, Enalapril, Metrogyl, Furosemide, Rifagut and Cefperaxone +Sulbactum. These drugs caused the variety of adverse effects in the patients. The occurrence of the adverse drug reactions becomes a major obstacle in treating liver disorder patients. Hence there is a need for individualization of patient regimen.

Among the total 150 patients, according to child Pugh score class-B 79 (52.66%) is majorly seen followed by the class-A 44 (29.33 %) and class-C 27 (18%). Child pugh score have noted its reliance on clinical assessment which may result in inconsistency in scoring and its broad classification of diseases are impractical when determining priority for liver transplantation[19].

Out of 150 patients 116 patients are not recovered while 34 patients are recovered. Due to slow recovery of the liver

problems. It takes time to recover. So in the hospital based study patient may not be able to present for a longer period. And the patients are discharged while slightly decreased in symptoms on their own and continue the medication prescribed from home.

CONCLUSION

Our study reveals that alcohol is the key etiological factor, contributing majority of the liver disorders. Abstinence from alcohol reduces the risk of developing serious complications and mortality.in our study majority of the patients were not recovered yet due to lack of awareness on liver diseases, late diagnosis and low compliance towards treatment regimen.

Apart from failure to adhere treatment regimen and late diagnosis drug related problems also affects the patient quality of life in liver disorders. Among all the drug related problems we found untreated condition, improper drug selection, failure to receive drugs, wrong dose are the major ones.

The study emphasizes the need to improve awareness of the patients on liver diseases to promote early diagnosis, alcohol abstinence and reduce mortality. Hence there is a need to increase the involvement of clinical pharmacist in designing appropriate therapeutic regimen along with other health care professionals, with the ultimate goal of preventing mortality due to liver disorders.

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