

Prescribing Pattern of Drugs in Patients with Alcoholic Liver Disease in a Tertiary Care Teaching Hospital

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Abstract: ***Preamble:** Even though alcoholism is related with causation of multiple diseases, alcoholic liver disease (ALD) is the most common cause of mortality. Various categories of drugs are being used in patients with ALD. **Aims and Objectives:** The goal of this study to assess the prescribing pattern of drugs used in patients with ALD. **Materials and Methods:** Hospital based prospective and observational study was approved out for a period of twelve months in a tertiary care hospital Shri B. M. Patil medical college hospital and Research centre, Vijaypur, Karnataka, India. All the patients of moreover gender identified with ALD were registered in the study and patient agreement was taken, the data connected to the patients of ALD were acknowledged in a structured and reported in patient data collection form and analyzed. **Results:** A total of 150 patients were included in the study, majority of males as compared to females, as they follow Indian tradition. Supreme patients admitted to medicine department (30.5%) were from age group 31 - 40 years followed by 28.9% from age group 41 - 50 years and 16% from age group 51 - 60 years. Total, 1, 147 drugs were prescribed for 150 patients, out of which hepatoprotective agents were the most commonly prescribed drugs 226 followed by antibiotics 159 prescriptions, vitamins and minerals 131 and antiulcer drugs 140. The most commonly prescribed antimicrobial drugs were cefotaxime, cephalosporin 49, diuretic was spironolactone 55, intravenous (IV) fluid was 25% dextrose (45.3%) and for treating the complications like propranolol 48 respectively. Benzodiazepines like Lorezepam, Chlordiazepoxide were the most common and the only drug prescribed for treating alcohol withdrawal symptoms. **Conclusion:** Hepatoprotective agents along with antibiotics, vitamins and minerals were the most commonly prescribed drugs for patients with ALD. Specialists, medical attendants, and drug specialists in the essential consideration setting play a significant part in the administration of patients with liquor related liver sicknesses. Corticosteroids were prescribed comparatively less in our study.*

Keywords: Alcoholic Liver Disease; Hepatoprotective Drugs; Antibiotics; Corticosteroids; Spironolactone; Lactulose; Liveril

1. Introduction

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, defines alcoholism, also known as alcohol use disorder, as a problematic pattern of alcohol use that results in psychological distress or clinically significant impairment. ^[1] An estimated 2.5 million deaths worldwide are attributed to alcoholism each year, accounting for 4% of all deaths. ^[2] It is the seventh most important risk factor for mortality in both sexes for all ages and the top risk factor for mortality in males aged 15–59. ^[2]

Alcoholic liver disease (ALD) accounts for the majority of alcoholism - related deaths, despite the fact that alcoholism is linked to over 60 diseases. In order of increasing severity, ALD comprises alcoholic steatosis, alcoholic hepatitis, and alcoholic cirrhosis. Additionally, 40% of cirrhosis - related deaths are caused by ALD. ^[3] In the overall population, the annual death rate for ALD is 4.4/1, 000, 000. ^[4] Drinking more than 30 grams of alcohol per day raises the risk of ALD in both sexes, and the development of ALD is dose - dependent. [5, 6] ALD is more common in women than in men, most likely as a result of variations in ethanol metabolism. ^{7-10]}

Pentoxifylline, ursodeoxycholic acid (UDCA), metadoxine, corticosteroids, and some alternative medications like Liv 52 and Silymarin are among the medications currently used to treat ALD, albeit their effectiveness varies. Antibiotics for infections; Cefotaxime, ceftriaxome, lactulose, rifaximin, and L - ornithine L - aspartate (LOLA) for encephalopathy; furosemide and spironolactone for ascites; octreotide,

propranolol, and ethamsylate for variceal haemorrhage; disulfiram and naltrexone for reducing alcohol dependence and cravings; and Lorazepam, chlordiazepoxide for withdrawal symptoms. ^[11, 12]

In order to make medical care more economical and logical, the study of prescription patterns aims to track, assess, and recommend changes in practitioners' prescribing practices. ^[13] There have been no encouraging results from a Medline search of the prescription patterns for medications in ALD. Therefore, the purpose of this study was to assess the prescription medicine usage patterns of patients with ALD.

2. Materials and Methods

This prospective observational study was carried out at a tertiary care teaching hospital. The case record files of all the inpatients of medicine department with a diagnosis of ALD between March 2023 and December 2023 were retrieved from medical records section after obtaining approval from Institutional Ethics Committee.

Patients of either sex above 18 years of age and diagnosed to have ALD based on clinical and biochemical evidence during the above - mentioned period were included in the study. Pregnant, lactating and those with malignancy were excluded from the study.

Using a specially created preform that included pertinent information such demographics (age, gender), clinical data (symptoms, length of alcohol use, and liver function test [LFT]), and pharmacological data, we examined the

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prescriptions of the aforementioned patients. Drug categories, individual medications administered together with their dosage, formulation, method, and frequency of administration are all included in drug data. The medications that were prescribed have been categorised into 10 groups for ease of use.

- 1) Hepatoprotective drugs
- 2) Antibiotics
- 3) Antiulcer drugs
- 4) Vitamins and minerals
- 5) IV fluids
- 6) Antiemetic's
- 7) Diuretics
- 8) Drugs for alcohol withdrawal
- 9) Corticosteroids
- 10) Miscellaneous

Statistical analysis was primarily expressive with all the data communicated as mean ± standard deviation and as percentages.

3. Results

A total of 150 prescriptions of in - patients with ALD were analyzed out of which 150 were males and no were females. The mean age of male patients was 41 whereas that for females was 55. The youngest patient was aged 19 years and the oldest patient was aged 70 years. The majority of the patients belonged to 31 - 40 age group 69 (30.3%) followed closely by 41 - 50 age group. The mean duration of alcohol intake was 16.96 in male patients.

On the whole, a total of 1, 147 drugs were prescribed for 146 patients with ALD out of which 574 (42.1%) were prescribed by generic name and 791 (57.9%) were prescribed by brand name.

Hepatoprotective agents were the most commonly prescribed drugs with a total of 226 prescriptions (15.63%) followed by vitamins and minerals of 131 prescriptions (11.63%) and antiulcer drugs of 140 prescriptions (13.60%). The least prescribed drugs were corticosteroids (0.02%).

Among the hepatoprotective drugs, Liv 52 (36.9%), Ursodiol, Metadoxine, Albumin and UDCA (36.6%) were the most commonly prescribed.

Result: The prescribing pattern in alcoholic liver diseases is following categories of drugs prescribed:

Table 1: Distribution of cases according to categories of prescribing drugs

Sr. no.	Categories of prescribing drugs	No. of prescription
1.	Hepatoprotective drugs	226
2.	Antibiotics	159
3.	Antiulcer drugs	140
4.	Vitamins and minerals	131
5.	IV fluids	70
6.	Antiemetic	33
7.	Diuretics	101
8.	Drugs for alcohol withdrawal	37
9.	Corticosteroids	2
10.	Miscellaneous	106

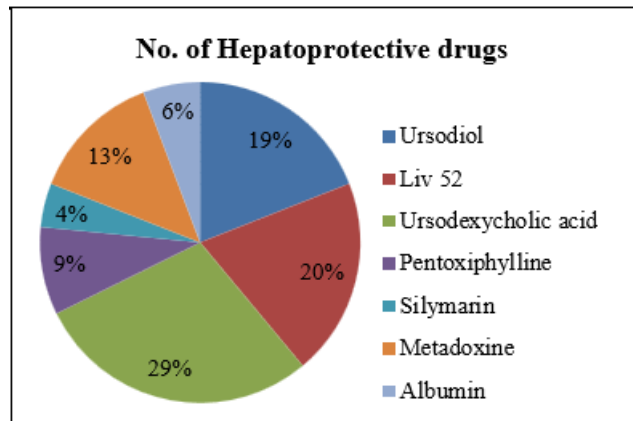


Figure 1: Distribution of cases according to categories of prescribing drug is in hepatoprotective drugs

Ursodeoxycholic acid is the hepatoprotective drugs prescribed to 65 patients and lowest albumin was prescribed to ALD patients.

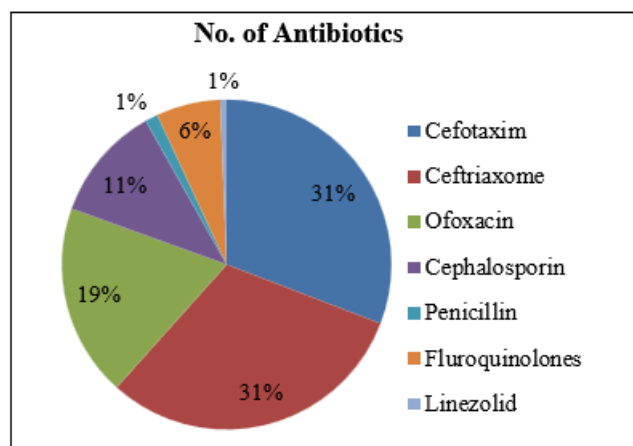


Figure 2: Distribution of cases according to categories of prescribing drug is in antibiotics

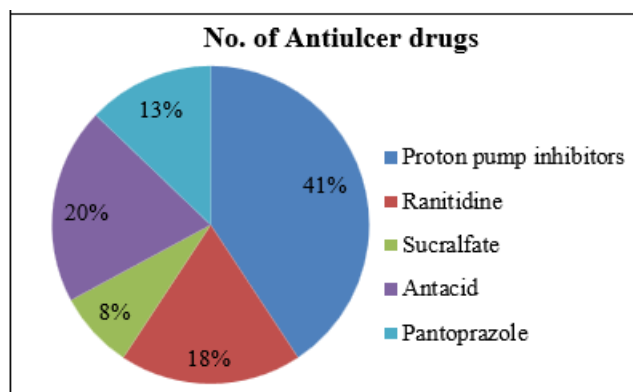


Figure 3: Distribution of cases according to categories of prescribing drug is in antiulcer drugs

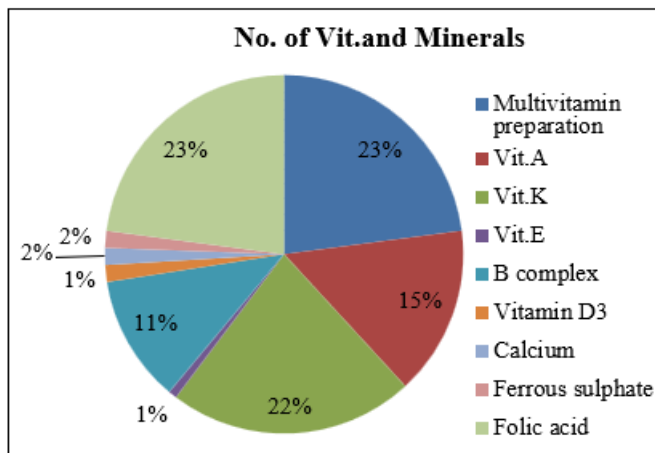


Figure 4: Distribution of cases according to categories of prescribing drug is in vitamins and minerals

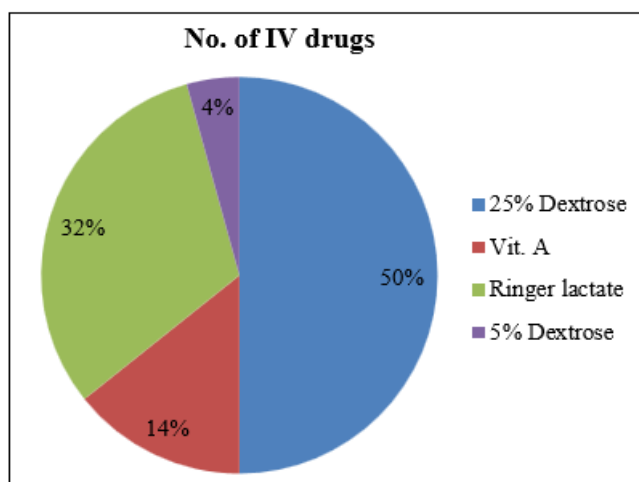


Figure 5: Distribution of cases according to categories of prescribing drug is in IV fluids

4. Discussion

As far as we are aware, no research has examined the prescription practices of ALD patients over the globe. For the first time, our study thoroughly examined every medication administered to individuals with ALD.

Despite the fact that numerous studies show that women are more likely than men to develop liver disease as a result of drinking less alcohol and for shorter periods of time, just two of the 146 patients in our study were female. This might be because of the sociological features of this nation, where alcohol consumption is nearly exclusively a male activity. In contrast, the peak age distribution of alcoholic hepatitis was found to be between 40 and 60 years old in the previous study [15]. This can be explained by the fact that, in contrast to other regions of the nation where we have shown that many people has a history of beginning to consume alcohol; this region has a habit of drinking alcohol from a very young age.

Hepatoprotective medications, which are meant to alleviate the liver's dysfunction in ALD, were the most frequently given class of medications in our study (Table 1). Liv 52 was the most often prescribed medication among them (Figure 1). Due to its antioxidant, anti-inflammatory, and immunosuppressive properties, this polyhedral formulation

has demonstrated substantial protection against alcohol-induced liver damage in both experimental [16, 17] and clinical trials [18, 19]. Its above-mentioned therapeutic effects with little side effects may be the cause of its extensive use.

Liv 52 was prescribed shortly after UDCA, a nontoxic, hydrophilic bile acid with cytoprotective, antiapoptotic, and immunomodulatory effects [21], followed by antioxidant metadoxine [22] and pentoxifylline, a nonspecific phosphodiesterase inhibitor that inhibits tumour necrosis factor (TNF- α) to slow down inflammation and subsequent liver fibrosis. [23] Recent guidelines suggest that it may be favoured in patients with infection or renal failure/hepatorenal syndrome and that it can be administered in conjunction with enteral feeding as a viable substitute for corticosteroids in individuals with severe ALD.

The least often prescribed hepatoprotective drug was silymarin, an alternate medication for liver disease patients. Its protective effects against many types of liver injury have been demonstrated in animal models, and its anti-inflammatory, antioxidant, antifibrotic, and immunomodulation properties are believed to account for its advantages in ALD.

As nutritional deficiency is very common in these patients, prescription of vitamin and mineral preparations was seen to be common in our study and overall they are the second most commonly prescribed drugs after hepatoprotectives. Antiulcer drugs were the third most commonly prescribed drugs in our study as long-term intake of alcohol damages the gastric mucosa to a large extent.

Since the liver is a vital organ for battling bacteria, damage to it increases the risk of bacteremia in patients who need antibiotics for either preventative or therapeutic purposes. [27]The most often prescribed antibiotics were cephalosporin's and metronidazole, which makes sense given that these medications treat the mixed infection with anaerobes of peritonitis that these patients frequently have. This is in line with the recommendations that patients should not take medications such as macrolide antibiotics, which include erythromycin, azithromycin, clindamycin, chloramphenicol, and tetracycline.

The most often used intravenous fluids were about 25% dextrose and ringer lactate, which may be explained by the fact that these patients will frequently have both nutritional deficiencies and electrolyte abnormalities. Diuretics should be used to treat ascites in patients with ALD. In our study, spironolactone, a potassium-sparing diuretic, was more frequently prescribed than the loop diuretic furosemide because ALD patients will experience secondary hyperaldosteronism and a medication that inhibits the aldosterone receptor will be more effective than the other diuretic classes—even more so than furosemide. . [28]

Patients with ALD frequently experience complications like hepatic encephalopathy and variceal hemorrhage, which must be treated immediately to reduce morbidity and death. Since hepatic encephalopathy is caused by elevated ammonia levels, the most often prescribed medications in

our study were LOLA and lactulose, which inhibit intestinal ammonia production through a variety of mechanisms [29, 30]. LOLA supports both of these ammonia detoxification pathways by providing ornithine and aspartate, which are crucial substrates in the metabolic conversion of ammonia to urea and glutamine, respectively. [28]

Steroids are recommended for two types of ALD: patients with hepatic encephalopathy and those with severe ALD, which is indicated by a Maddrey discriminant function of ≥ 32 . Although steroids are among the most well-established and researched medications for treating severe alcoholic hepatitis, their benefits in ALD are still unclear. [28] Since inflammation plays a significant role in the pathophysiology of ALD, they work by lowering inflammatory cytokines like TNF - α , intercellular adhesion molecule 1, interleukin (IL) - 6, and IL - 8 [24]. Prednisolone is preferred over prednisone because the latter must be converted in the liver to its active form, prednisolone, even though numerous agents have been used in various studies. We discovered that only one patient (0.01%) received corticosteroids, indicating that they are prescribed very infrequently in our study.

Although anti - TNF - α agents (like infliximab and etanercept) and other anticytokine agents are among the many new medications available for patients with ALD, they were not prescribed in our study, which may be explained by financial constraints in a developing nation like India. As was to be expected given that all of these patients were inpatients receiving treatment for ALD and that these medications would only be prescribed after they were discharged from the hospital, no medications such as naltrexone, acamprosate, disulfiram, topiramate, and baclofen were prescribed to reduce alcohol dependence and craving.

This study's strength is that it was the first of its kind to examine the medications prescribed to patients with ALD. Our thorough analysis of every medication used in ALD patients, including the drug class, dosage form, and prescribed dose, is another significant strength of our research. Among the study's limitations are its relatively small sample size, its uniconcentric design, the inability to compare regional differences in drug prescription practices, and the failure to assess variables such as patient concerns regarding the negative effects of medications during treatment and adherence to treatment guidelines. Since this was the first study to examine how medications were prescribed to patients with ALD.

5. Conclusion

Hepatoprotective agents are the most often prescribed medications, followed by vitamin and mineral preparations and antiulcer medications, according to our prospective observational study, which examined the prescribing patterns of medications used in patients with ALD for the first time. The most often prescribed antimicrobial medications were cephalosporins, such as cefotaxim and ceftriaxome. Spironolactone was the most often prescribed diuretic, and 25% dextrose was the most often used intravenous fluid. The medications prescribed to treat the

symptoms of alcohol withdrawal were lorazepam and chlorthalidone. In our study, fewer corticosteroids were prescribed. New medications with greater efficacy, such as anti - TNF - α agents, were also not prescribed, most likely due to financial limitations.

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