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ETIOLOGICAL CAUSES OF RAISED LIVED ENZYMES IN A TERTIARY CARE CENTER

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ABSTRACT

There are various reasons for hepatitis and elevation of liver enzyme. Alcoholic liver disease leading to cirrhosis is the commonest cause of raised liver function. Apart from alcoholism various other conditions such as biliary tree pathologies, hepatitis, inflammatory bowel disease etc. can cause increase in liver enzyme levels. Drug-induced liver injury (DILI) is a minor but significant cause of liver injury across all regions. The rationale for doing this study was to get better understanding of the distribution of hepatobiliary pathologies in Coimbatore. So that adequate care can be given for the prevention of the aetiology in the future. Hence we propose to perform this study. To find out the percentage of etiological causes of raised liver enzymes in a tertiary care Center. To find out the most common etiology among elevated liver enzymes. To correlate age and sex with the etiology of the elevated liver enzymes Methods and Materials: After ethics approval a cross sectional study was carried out. Through Hospital Information system patients with elevated liver enzymes were identified. Age, sex and diagnosis were recorded from their charts. 100 patients were recruited. There were 72% of males and 28% of females. There age of patients were ranging from 10-79 years. The most commonly occurring liver pathologies seen in this demographic were alcoholic hepatitis and viral hepatitis. sex distribution of alcoholic liver damage showed that only 5% of the patients were women. The most common viruses were found to be Hepatitis B, Hepatitis C, Hepatitis A and Hepatitis E in that order of incidence. Hepatitis B was the leading cause of viral hepatitis. Conclusion: Our study showed that the leading causes of elevated liver functions were alcoholic liver damage and viral hepatitis. Males are affected three times more by these diseases than women. It was found that the pattern of disease distribution and incidence of hepatic pathology in women was different from the pattern of distribution in men. This discrepancy may be attributed to lifestyle differences, local politics and societal pressures. The data set collected in our study was very wide and may be used for future studies to explore in detail.

Key words: Elevated Liver Enzymes, SGOT, SGPT, ALP, Alcoholic Liver Disease, Viral Hepatitis.

INTRODUCTION

Liver function tests (LFT) are a battery of tests which measure various parameters to identify damage to liver tissue or inflammation in the liver. Liver enzyme testing involves testing for aspartate transaminase, alanine transaminase and alkaline phosphatase. True liver function testing includes international normalized ratio (INR), prothrombin time (PT), serum albumin and serum bilirubin [1]. Liver enzymes are generally contained within the hepatocytes and when the hepatocytes are subjected to injury, these enzymes leak out into the blood and as a result their serum levels are elevated [2]. LFT derangements have been categorized into various types based on observed patterns such as cholestatic derangement, hepatocellular derangement, and failure of synthetic function [3]. Essentially liver function testing is a stepping stone used to diagnose and locate any hepatobilliary pathology.

Alcoholic liver disease leading to cirrhosis is the commonest cause of raised liver function [3]. Alcohol can cause damage to the liver in two ways. It can increase the oxidative stress by depleting glutathione stores or it can damage the intestines and cause the spread of the toxins produced by the bacteria in the intestines. Apart from alcoholism various other conditions such as biliary tree pathologies, hepatitis, inflammatory bowel disease etc. can cause increase in liver enzyme levels [4].

Drug-induced liver injury (DILI) is a minor but significant cause of liver injury across all regions. DILI

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accounts for approximately 10 percent of all cases of acute hepatitis. Fewer than 10% of drug-induced liver injuries progress to acute liver failure, with an estimated incidence of only one to two cases per million people per year. However, up to 80% of patients who develop liver failure might die or require transplantation. The drugs responsible vary by location and prevailing drug use, with anti-infectives, anticonvulsants, and anti-inflammatory drugs most commonly implicated; herbal or adulterated traditional or complementary medications are also a notable cause in east Asia [5, 6].

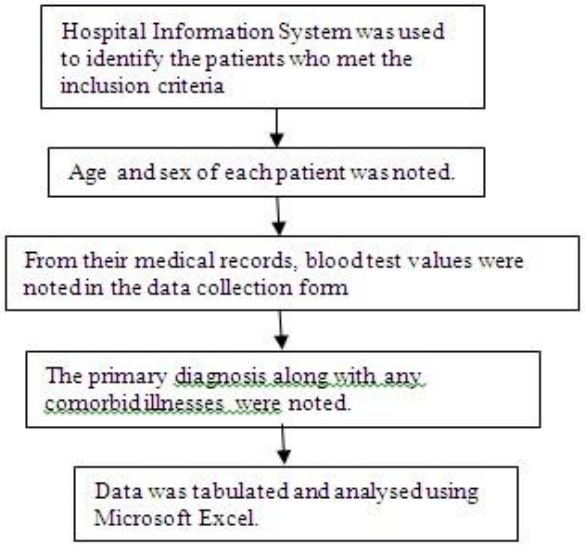
Acute liver injury is nowadays on the rise and with the advancements in medical diagnostic technologies; we have become adept at diagnosing them earlier [7]. The rationale for doing this study was to get better understanding of the distribution of hepatobiliary pathologies in Coimbatore. So that adequate care can be given for the prevention of the etiologies in the future. Hence we propose to perform this study.

METHODS AND MATERIALS

- Type of study: Cross sectional
- Ethics approval: Study design and methods approved by the IHEC
- Sample size: 100
- Data collection time: 5 months, retrospectively
- Inclusion Criteria
- Out patients of the Department of Gastroenterology
- AST (SGOT) > 50 U/L OR ALT (SGPT) > 60 U/L OR both
- Exclusion Criteria
- When the diagnosis was not made for raised liver enzymes
- Patients who had been treated symptomatically

Ethics

Ethical approval was obtained from the Institutional Human Ethics Committee at PSG Institute of Medical Sciences and Research.



RESULTS

Sex Distribution

Table 1. Sex Distribution of Elevated Liver Enzymes

S.No	Sex Distribution	
1	Male	72%
2	Female	28%

Age Distribution

Table 2. Age Distribution of Elevated Liver Enzymes

S.No	Age in years	Number
1	10 to 19	3%
2	20 to 29	19%
3	30 to 39	16%
4	40 to 49	17%
5	50 to 59	24%
6	60 to 69	14%
7	70 to 79	7%

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Disease Distribution

Table 3. Disease Distribution of Elevated Liver Enzymes

Disease Aetiology	***Percentage***	***Disease Aetiology***	***Percentage***
Alcoholic Liver Disease	20%	Carcinoma Stomach	1%
HBV	14%	Chronic Pancreatitis	1%
HCV	13%	Chronic Renal Failure	1%
fatty liver disease	10%	DRESS Syndrome	1%
Chronic Liver Disease	9%	Encephalopathy	1%
Chronic Gastritis	4%	ethanol Related pancreatitis	1%
Colangitis	4%	Granulomatous Liver Disease	1%
Autoimmune hepatitis	2%	Heriditary Spherocytosis	1%
Estrogen induced injury	2%	Hyperbilirubinemia	1%
HAV	2%	Lower Respiratory Tract Infection	1%
HEV	2%	Portal Hypertension	1%
Hepatocellular Carcinoma	2%	Portal vein Thrombosis	1%
inflamatory bowel disease	2%	telangiectasia	1%
Bile duct Transection	1%		

Fig 1. % of Sex Distribution of Elevated Liver Enzymes

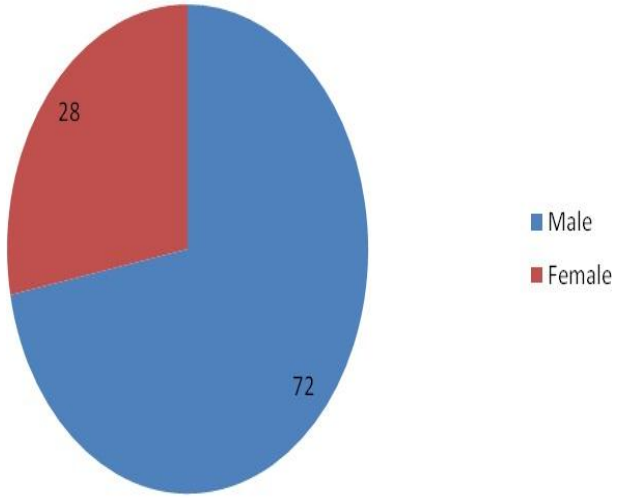

Fig 2. Age distribution of Elevated Liver Enzymes

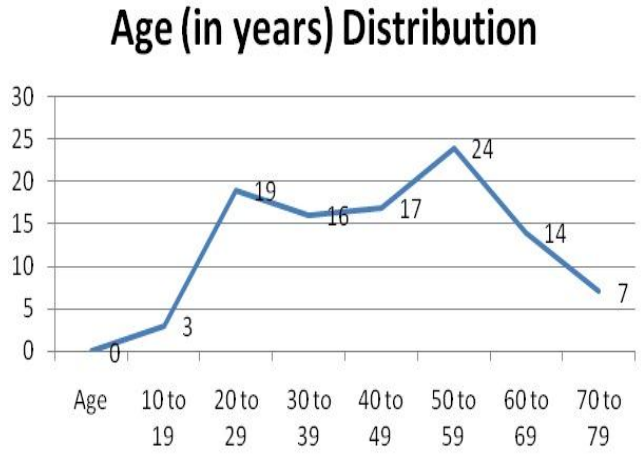

Fig 3. % of Disease Distribution of Elevated Liver Enzymes

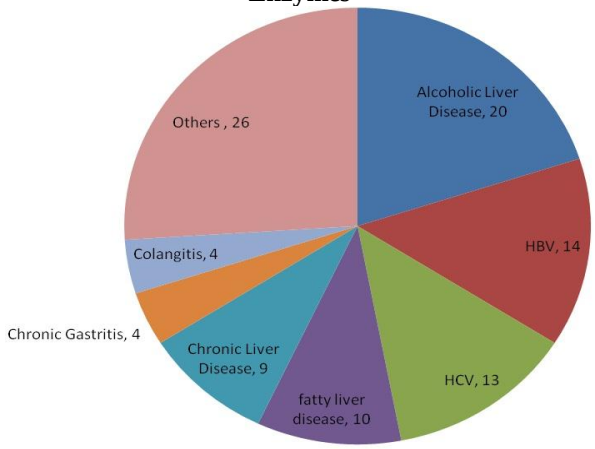

Fig 4. Age (in years) Distribution of Alcoholic Liver Disease

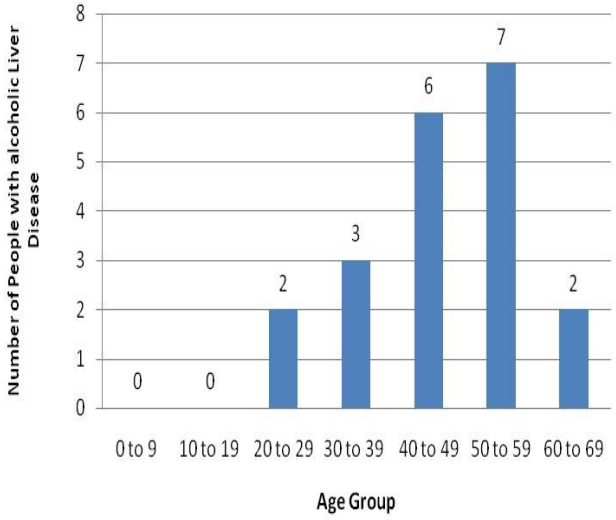

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Fig 5. Incidence of Various Types of Viral Hepatitis

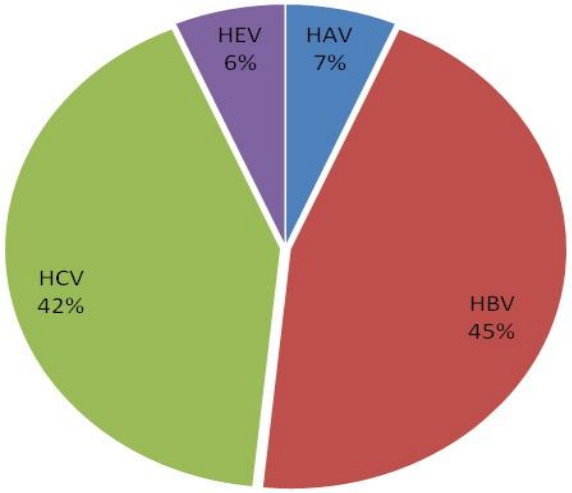


Fig 6. Sex Distribution of Viral Hepatitis

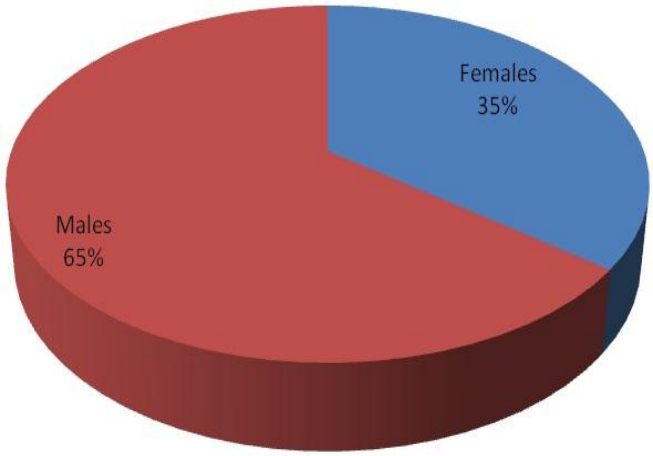


Fig 7. Age Distribution of Viral Hepatitis

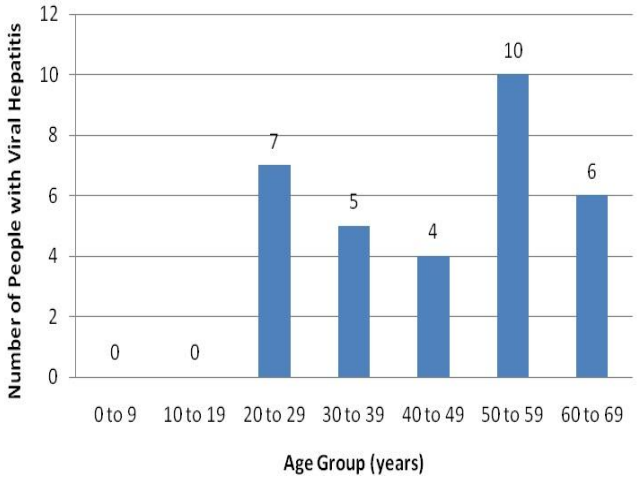


Fig 8. % of Distribution of hepatic disease in females

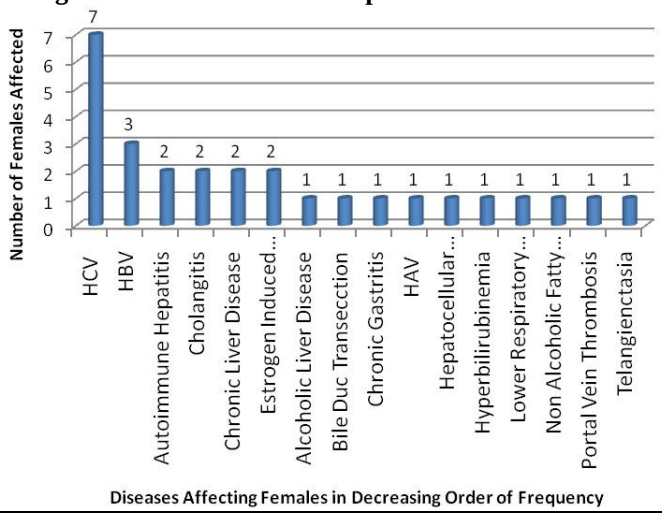
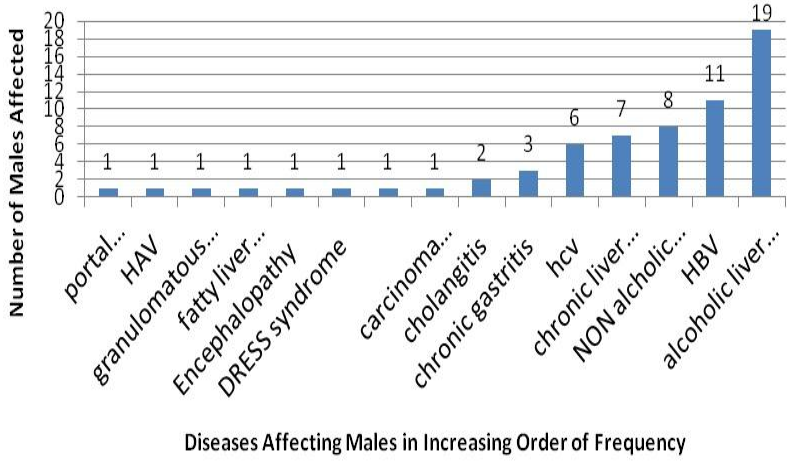


Fig 9. % of Distribution of hepatic disease in males



DISCUSSION

The most commonly occurring liver pathologies seen in this demographic were alcoholic hepatitis and viral hepatitis. These two health issues constitute 51 percent of all the causes of elevated liver function tests.

Alcoholic hepatitis was the most common cause of elevated LFTs. 20% of the patients were affected by

alcoholic liver disease. Coimbatore is located in the state of Tamil Nadu where the sale of alcohol is not banned or restricted but facilitated by the government. In addition, social drinking is now promoted in all circles, both educated and uneducated. These social and political circumstances may explain why alcoholic liver damage is the leading cause of deranged LFTs.

Further analysis of the sex distribution of alcoholic liver damage showed that only 5% of the patients were women. This unequal distribution showed that a very small number of women consume enough alcohol to cause a significant damage to their liver.

Alcoholic liver disease was the condition most commonly associated with hepatic complications. 25% of all the patient suffering from alcoholic liver disease were suffering from portal hypertension and were on treatment for it. This high incidence of portal hypertension in alcohol induced liver disease can be attributed other changes in the portal vascular bed due to alcoholism.

Following alcoholic liver injury, the next most common cause for liver pathologies was viral hepatitis. The most common viruses were found to be Hepatitis B, Hepatitis C, Hepatitis A and Hepatitis E in that order of incidence [Fig 5]. Hepatitis B was the leading cause of viral hepatitis. Hepatitis B can be spread by sexual contact and is notoriously spread by contact with blood. This may be due to less awareness about safe sex practices and 30% chance of transmission of HBV through blood. 42% of viral hepatitis patients were due to HCV. It may be due to improper screening at blood banks and use or reuse of infected needles by drug abusers.

Among these viral hepatitis patients 65% were males and 35% were females [Fig. 6].In HBV patients 78% were males and 22% were females. And in HCV patients 54% were males while 46% were females.

When exploring the age distribution of various viral hepatitis patients, it was evident that the age distribution of viral hepatitis follows bimodal distribution [Fig. 7]. The peak age groups for hepatitis were 50 – 59 years of age and 20-29 years of age. In the age group of 50-59 years, there may be more surgical and medical diseases which require blood transfusion. One third of the affected viral hepatitis patients were in this age group. In the age group of 20-29 years, it may due to sexual promiscuity or drug addiction. All the patients in these two age groups were infected with HBV or HAV. There was no incidence of HCV in these age groups.

28% of the patients with elevated liver enzymes were females [Fig. 1] . Among them the distribution of hepatic disorders was different from the disease distribution in males. Among females the most common causes were Hepatitis C (25%) and Hepatitis B (11%). Specific to females, estrogen dependent liver injury was seen 7% of females. [Fig. 8]

In males the distribution of the hepatic diseases was drastically different than from in females. Most common cause of hepatitis in males was alcoholic liver disease. This may be due to consumption of alcohol is more in males compared to females. Next common cause in males was HBV infection, similar to females. The next common causes were non alcoholic fatty liver disease and chronic liver disease. These may be due to minimal physical activity and improper dietary habits. [Fig. 9].

CONCLUSION

The rationale of this study was to understand the distribution of the various diseases causing elevation of liver enzymes. Our study showed that the leading causes of elevated liver functions were alcoholic liver damage and viral hepatitis. Males are affected three times more by these diseases than women. It was found that the pattern of disease distribution and incidence of hepatic pathology in women was different from the pattern of distribution in men. This discrepancy may be attributed to lifestyle differences, local politics and societal pressures. The data set collected in our study was very wide and may be used for future studies to explore in detail.

LIMITATIONS

1. Since the sample size of our study was small, patients with very low incidence of elevated liver enzymes (<2%) like bile duct transection, chronic pancreatitis, carcinoma stomach could not be studied
2. We have excluded many patients who had not come for follow up. This could have affected the pattern of etiology of liver disease.

STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

ACKNOWLEDGMENT

Nil

CONFLICT OF INTEREST

None.

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