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Clinico-Epidemiological Profile of Elderly Patients with Non-Alcoholic Fatty Liver Disease

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Abstract
Introduction*:Most patients of Non-alcoholic fatty liver disease (NAFLD) are in the age group of 40 to 50 years, which is also associated with more severe liver fibrosis and higher mortality. In this study we aim to understand the clinic-epidemiological profile of patients with NAFLD in Jalandhar district of Punjab.*
Methodology: *We selected patients from randomly selected five hospitals in Jalandhar district, Punjab from January 2017 till June 2017. We included all consecutive patients, aged 60 years or above, with a diagnosis of NAFLD. We interviewed the patients using a pre-tested semi-structured questionnaire. Patient related information like demographics, lifestyle related risk factors, body mass index (BMI), alcohol and smoking habitswere collected. Furthermore, we collected information on various metabolic variables of the patients like fasting glucose, lipid profile and liver function test.*
Results:*We enrolled 382 patients with confirmed diagnosis of NAFLD; males comprised of 63% of the total study population. 48% of the patients in our study had BMI between 25 and 30 kg/m^2, and 38% had BMI more than 30 kg/m^2. Majority of the patients in our study population were current alcoholics and smokers. 50% of the patients had fasting glucose higher than 110 mg/dL, 52% of the patients had triglycerides higher than 150 mg/dL and HDL levels higher than normal in 48% of the patients. Average aspartate transaminase reported was 17 U/L, average alanine transaminase was 22 U/L and average gamma-glutamyltransferase was 19 U/L.*
Conclusions: *NAFLD may progress to fibrosis or cirrhosis in the older age group patients. Usually mild or moderate elevations in liver enzymes levels are seen, though normal enzyme levels do not exclude NAFLD.*
Keywords: *alcohol, cirrhosis, lifestyle, liver, prognosis*

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I. Introduction

Non-alcoholic fatty liver disease (NAFLD) is the presence of hepatic steatosis when no other causes for secondary hepatic fat accumulation can be elucidated. It may progress to cirrhosis and is an important cause of cryptogenic cirrhosis. NAFLD) is seen across the globe and is a very commonly seen liver disorder in industrialized countries where the major risk factors for NAFLD like central obesity, type 2 diabetes mellitus, dyslipidemia, and metabolic syndrome are common. Worldwide, the prevalence of NAFLD has a reported as 6 to 35% (median 20%). Estimates of prevalence of NAFLD in Asia-Pacific regions range from 5 to 30%. The pathogenesis of nonalcoholic fatty liver disease has not been fully understood. The most widely supported theory implicates insulin resistance as the key mechanism leading to hepatic steatosis, and perhaps also to steatohepatitis. It has been reported by numerous studies that patients with NAFLD often have one or more components of the metabolic syndrome.

Most of the patients of NAFLD are in the age group of 40 to 50 years. Moreover, studies suggest that advancing age is associated with more severe liver fibrosis and higher mortality. In light of this, there are a number of patient related social, demographic and clinical variables which affect the overall morbidity and mortality associated with NAFLD. In this study we aim to understand the clinic-epidemiological profile of patients with NAFLD in Jalandhar district of Punjab.

II. Methodology

Study Design and Setting

We performed a cross-sectional study of elderly patients who were diagnosed with NAFLD to understand their clinic-epidemiological profile. The patients were selected from randomly selected five hospitals in Jalandhar district, Punjab from 1stJanuary 2017 till 30thJune 2017. Jalandhar, a major city in Punjab, has an estimated population of a little over 800,000 according to 2011 census. Males comprise approximately 53% of the population and the literacy rate of the city is 85%.

Sample population

At each centre, the patients were diagnosed with NAFLD by an experienced physician based on the prevalent clinical practice. Use of ultrasonography was the main criteria for diagnosing NAFLD. Biopsy was done in some cases as deemed necessary by the treating physician. We included all consecutive patients, aged 60 years or above, with a diagnosis of NAFLD during the above mentioned study duration at the specified hospital. We excluded only those patients who refused consent.

Data Collection and Data Analysis

After enrolment in the study, we interviewed the patients using a pre-tested semi-structured questionnaire. This included demographic information of the patient like age, gender and education level. Further, we collected information on lifestyle related risk factors in these patients. Anthropometric measurement were done on these patients as part of their routine care and management in their respective treatment centres. We performed the measurements where they were missing. Body Mass Index (BMI), waist hip ratio (WH), alcohol intake and smoking habit was inquired from the patient. We classified patients as former smoker or alcoholics if they quit one year prior to the interview. Past medical history of the patients was inquired as well, mainly focussing on hypertension and diabetes. Further we collected information on various metabolic variables of the patients. Data on fasting glucose, lipid profile and liver function test was obtained from the clinical records of the patients. Based on the criteria set by the Adult Treatment Panel III, the number of patients with serum triglycerides higher than150 mg/dl or drug treatment for elevated triglycerides, serum high density lipoprotein (HDL) cholesterol less than 40 mg/dl in men and less than 50 mg/dl in women or drug treatment for low HDL-C, and fasting plasma glucose higher than 110 mg/dl or drug treatment for elevated blood glucose was noted. The data was entered in Microsoft excel sheet and analysed using Epi Info statistical software to be presented in frequency tables. The normality of the data was checked using Kolmogorov–Smirnov test. Normally distributed data was presented as mean, standard deviation and range.

III. Results

During the study period we enrolled 382 patients with confirmed diagnosis of NAFLD. The average age of the patients was 78.4±4.92 years. Males comprised of 63% of the total study population (Table 1). Majority of the patients in our study had education level till primary (44%). 48% of the patients in our study had BMI between 25 and 30 kg/m^2, and 38% had BMI more than 30 kg/m^2. Average waist hip ratio in the patients we observed was 0.92±0.05. Majority of the patients in our study population were current alcoholics and smokers (50% and 49% respectively). Hypertension was observed in 72% of the patients and diabetes in 25%. 50% of the patients had fasting glucose higher than 110 mg/dL. Lipid profile of the patients revealed that 52% of the patients had triglycerides higher than 150 mg/dL and HDL levels higher than normal in 48% of the patients. Results of the liver function test revealed that the average aspartate transaminase reported was 17 U/L with a range of 12 to 19, average alanine transaminase was 22 U/L with a range of 20 to 25 and average gamma-glutamyltransferase was 19 U/L (Table 2).

IV. Discussion

Our study describes the social, demographic and clinical picture of patients with NAFLD in our study setting. Clinically, NAFLD is sub-classified into nonalcoholic fatty liver (NAFL) and nonalcoholicsteatohepatitis (NASH). In NAFL, hepatic steatosis is present without evidence of inflammation, whereas in NASH, hepatic steatosis is associated with hepatic inflammation that histologically is indistinguishable from alcoholic steatohepatitis. Numerous studies point out to the fact that NAFLD has higher chance to progress to severe liver fibrosis in advanced age. Other than that diabetes mellitus, elevated serum aminotransferases, body mass index (BMI) $\geq$28 kg/m^2, higher visceral adiposity index, which takes into account waist circumference, BMI, triglycerides, and high-density lipoprotein level are associated with disease progression or advanced fibrosis. Heavy alcohol use among patients with or at risk for NAFLD is associated with hepatic steatosis, hepatic injury, and fibrosis progression. In a study of 71 patients with NAFLD followed for a mean of 14 years, 17 patients (24%) had fibrosis progression. Heavy (more than 60 g of alcohol on one occasion for men or 48 g for women) episodic drinking was more common in those with fibrosis progression than in those without progression (47 versus 11%).

The true prevalence of abnormal liver enzymes among patients with NAFLD is unknown, since many patients with NAFLD are diagnosed only when they are noted to have abnormal levels. When elevated, the aspartate transaminase (AST) and alanine aminotransferase (ALT) are typically two to five times the upper limit of normal, with an AST to ALT ratio of less than. It has also been reported that the degree of aminotransferase elevation does not predict the degree of hepatic inflammation or fibrosis. Similarly, a normal alanine aminotransferase does not exclude clinically important histologic injury. Although not observed in our study, previous studies have reported an elevated serum ferritin concentration or transferrin saturation in patients with

NAFLD. There is evidence that a serum ferritin greater than 1.5 times the upper limit of normal is associated with a higher NAFLD activity score and with advanced hepatic fibrosis.

Metabolic syndrome is another important risk factor for the development of NAFLD. After adjusting for age, gender, and body mass index, metabolic syndrome was associated with an increased risk of severe fibrosis in a study (odds ratio [OR] 3.5, 95% confidence interval [CI] 1.1-11.2). 48% of our patient population had BMI between 25 to 30 kg/m^2. Weight loss and increased physical activity has been shown to result in sustained improvement in liver enzymes, histology, serum insulin levels, and quality of life in patients with NAFLD. One randomized trial of weight loss in 31 overweight and obese patients (body mass index [BMI] 25 to 40 kg/m^2) with biopsy proven NAFLD showed that participants in the weight loss group had higher histologic improvement (72 versus 30%). A number of pharmacological treatments have also been recommended by various authors.

V. Conclusion

NAFLD refers to the presence of hepatic steatosis when no other causes for secondary hepatic fat accumulation are present. It may progress to fibrosis or cirrhosis, specially in the older age group patients. Mild or moderate elevations in the aspartate aminotransferase and alanine aminotransferase levels are seen, though normal aminotransferase levels do not exclude NAFLD. Future studies should survey large populations of patients with NAFLD at multiple centres for better understanding of the risk factors involved in the pathogensis of NAFLD.

Table 1. Socio-demographic variables of patients enrolled in the study

Variable	***n* (%)**
Total patients in the study	382
Average age (years)	78.4±4.92
Gender distribution	
Males	242 (63%)
Females	140 (37%)
Education status	
Illiterate	80 (21%)
Primary	168 (44%)
Post-primary	134 (35%)
Body Mass Index (kg/m^2)	
Less than 25	74 (14%)
Between 25 and 30	183 (48%)
More than 30	125 (38%)
Average waist hip ratio	0.92 ± 0.05
Alcoholics	
Never	89 (23%)
Former	101 (26%)
Current	192 (50%)
Smokers	
Never	114 (29%)
Former	80 (22%)
Current	188 (49%)
Past medical history	
Hypertension	275 (72%)
Diabetes	96 (25%)

Table 2. Laboratory profile of patients with non-alcoholic fatty liver disease

Laboratory investigation	***n* (%)**
Fasting glucose (>110 mg%)	225 (59%)
Lipid profile	
Triglyceride >150 mg%	199 (52%)
High density lipoprotein <40mg% in males and <50mg% in females	183 (48%)
Liver function tests	Value (range)
Average aspartate transaminase (range)	17 U/L (12-19)
Average alanine transaminase (range)	22 U/L (20-25)
Average gamma-glutamyltransferase (range)	19 U/L (16-22)

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