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SOCIODEMOGRAPHIC & CLINICAL-PATHOLOGICAL EVALUATION OF NON-ALCOHOLIC FATTY LIVER DISEASE AMONG BANGLADESHI POPULATION: A SINGLE CENTER STUDY

Dr. Forhad Hossain Md. Shahed[1], Dr. Jewel Barai[2], Dr. Faroque Ahmed[3], Dr. Abul Hayat Manik[4], Prof. Mamun Al Mahtab Swapnil[5], Dr. Noor Jahan Alam Chowdhury[6], Dr. Moinul Hossain[7]

1. Assistant Professor, Department of Hepatology, Dhaka Medical College Hospital Dhaka, Bangladesh
2. Registrar, Department of Hepatology, Dhaka Medical College Hospital Dhaka, Bangladesh
3. Associate Professor, Department of Hepatology, Dhaka Medical College Hospital, Dhaka, Bangladesh
4. Medical Officer, Department of Hepatology, Dhaka Medical College Hospital, Dhaka, Bangladesh
5. Professor & Head, Department of Hepatology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh
6. Resident, Department of Pharmacology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh
7. Consultant, Department of Radiology, Chattogram Medical College Hospital, Chattogram Medical College Hospital, Chattogram, Bangladesh

ARTICLE INFO | **ABSTRACT** | **ORIGINAL RESEARCH ARTICLE**

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Background: Non-alcoholic fatty liver disease (NAFLD) is a term that refers to a variety of clinicopathological abnormalities in the liver that are a leading cause of hepatic dysfunction and mortality. Obesity, type 2 diabetes, and metabolic syndrome are all contributing to an expanding health problem that goes unreported. There is a scarcity of population-based data in a representative sample of the general population in Bangladesh. **Aim of the study:** The aims of the study were to evaluate the socio-demographic & clinical-pathological non-alcoholic fatty liver disease among Bangladeshi population. **Method:** This cross-sectional study was conducted from July 2019 to December 2019 at Dhaka Medical College Hospital, Bangladesh. This study was purposefully conducted among 35 participants. **Results:** Among 35 participants, the mean age of the participants were 38.89±8.50 years. Maximum participants (80%) were female and housewife (68.6%). And 60% participant's socioeconomic status was middle class state. Maximum (48.6%) participants had diabetes mellitus (DM) and obesity (42.9%). The HBs Ag and Anti-HCV was negative among all participants. Their

Corresponding author
Dr. F. H. Md. Shahed*

mean body weight was 72.74±8.74 and mean body height was 61.37±2.67. Here, the odds ratio of the stiffness of liver CAP was 0.75 and the odds ratio of fibroscan of liver CAP was 1.00. **Conclusion:** NAFLD affects almost one-third of Bangladesh's population. Non-alcoholic fatty liver disease is more common in people with a high BMI (overweight and obese), diabetics, and people in their forties and fifties. The scope of non-alcoholic fatty liver disease is enormous, and healthcare institutions must act quickly. As a result, a focused treatment strategy for non-alcoholic fatty liver disease should be developed.

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INTRODUCTION

Hepatic steatosis is a part of non-alcoholic fatty liver disease (NAFLD), where there is absence of excess alcohol consumption. NAFLD has a wide variety of symptoms, from simple steatosis to non-alcoholic steatohepatitis (NASH), fibrosis, and finally cirrhosis, which has its own set of consequences, including decompensation and hepatocellular carcinoma (HCC).[1] NAFLD is becoming a more important public health issue as a result of the worldwide obesity pandemic, and it is quickly becoming the most common cause of chronic liver disease. In the near future, it is likely to become the most common reason for liver transplantation.[2] Despite the fact that most individuals with NAFLD do not die from liver disease, they have a much higher risk of early morbidity and mortality.[3,4] NAFLD develops in a substantial proportion of people with type 2 diabetes and the metabolic syndrome, and it can lead to cancer.[5-7] NAFLD is the most frequent cause of hepatic dysfunction in industrialized countries right now, and it's expected to be the same in developing countries in the coming decades.[8] In Western countries, the prevalence of NAFLD varies between 20% and 30%.[9] The prevalence of NAFLD varies across Asia, depending on the area. In the Indian subcontinent, however, the prevalence of NAFLD is estimated to be 16-32 % in urban areas and 9-16 % in rural areas.[9] Due to shifting dietary trends and sedentary lifestyles, Bangladesh is also seeing an increase in NAFLD[10]. In May 2014, the World Health Organization (WHO) reported that liver illnesses account for 2.82 percent of all fatalities in Bangladesh. In Bangladesh, it is the eighth most prevalent cause of death, with a death rate of 19.26 per 100 000 people.[11,12] Chronic liver disorders (CLDs) account for 37-69 percent of all liver diseases in Bangladesh, and NAFLD is a significant contributor to the burden of CLDs.[12] However, evidence on the prevalence of NAFLD in Bangladesh is scarce. Because many individuals with NAFLD are asymptomatic, have limited access to healthcare facilities, and are afraid of large financial cost, hospital-based prevalence estimates in low-income countries like Bangladesh may underestimate the true burden of illness.[13, 14] Identification of relevant risk factors could lead to earlier discovery of the problem and more effective treatment.

OBJECTIVE

The aim of the study was to evaluate the socio-demographic & clinical-pathological status of non-alcoholic fatty liver disease among Bangladeshi population.

MATERIALS AND METHODS

Type of Study - A cross-sectional study

Place of Study - OPD, Department of Hepatology, Dhaka Medical College Hospital Dhaka, Bangladesh

Period of study- July 2019 to December 2019

Sample size - 35 participants

Data collection method: Data collected from the participants in a prescribed protocol.

Data analysis: Data were entered in the computer using SPSS version 21.0, calculation of percentage resistance within a 95% confidence interval (CI). The level of significance was considered as a "P" value less than 0.05 and double-checked before analysis.

RESULTS

Table 1: Demographic status of participants (N=35)

Variables	n	%	Mean ± SD
Age group			
<40	17	48.6	
40-60	18	51.4	
Mean in Age	35		38.89 ± 8.50
Gender			
Male	7	20.0	
Female	28	80.0	
Occupation			
Housewife	24	68.6	
Service	4	11.4	
Engineer	1	2.9	
Shop Keeper	1	2.9	
Driver	1	2.9	
Immigrant	1	2.9	
House Maid	1	2.9	
Nurse	1	2.9	
Doctor	1	2.9	
Food habit			
Rice 1 time	3	8.6	
Rice 2 times	13	37.1	
Rice 3 times	19	54.3	
Exercise			
Yes	5	14.3	
No	29	82.8	
Occasional	1	2.9	
Socioeconomic state			
Low Class	12	34.3	
Middle Class	21	60.0	
High Class	2	5.7	

Table 1 showed the demographic characteristics of the participants of the study. Among 35 participants, 48.6% participants were below 40 years old and 51.4% were between 40 to 60 years old. The mean age of the participants was 38.89 ± 8.50 years. Maximum participants (80%) were female and housewife (68.6%). Maximum participants (82.8%) were not used to with exercise. And 60% participant's socioeconomic status was middle class state.

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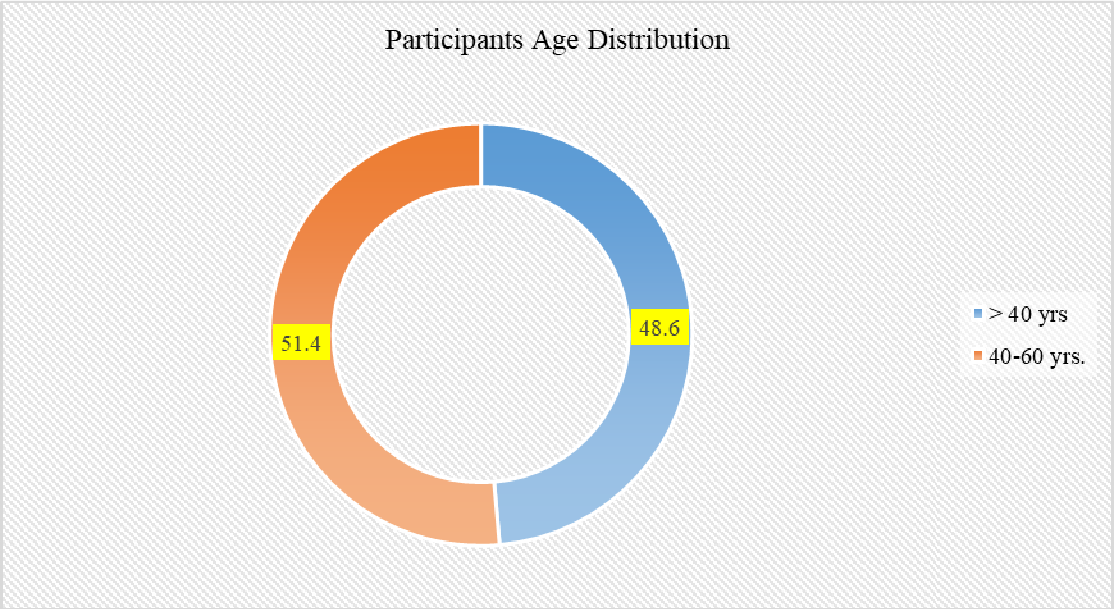

Figure I: Participants Age Distribution

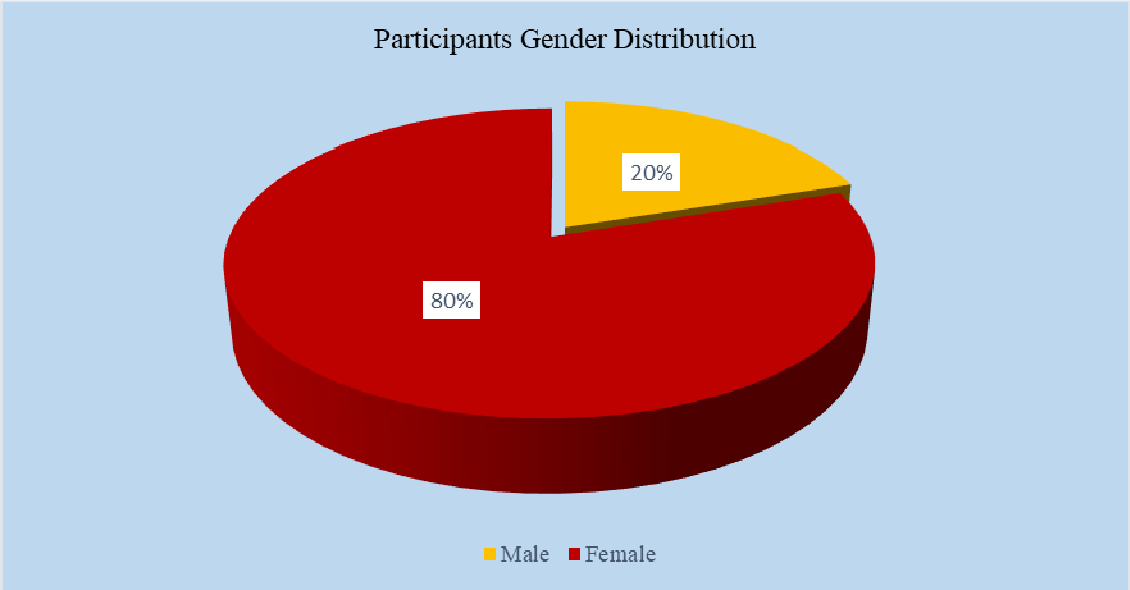

Figure II: Participants Gender Distribution

Table 2: Risk factors status of participants (N=35)

Variables	n	%	Mean ± SD
Risk factors			
HTN	8	22.9	
DM	17	48.6	
Obesity	15	42.9	
IHD	2	5.7	
Hyperlipidemia	9	25.7	

Thyroid disorders	2	5.7	
HBs Ag			
Positive	0	0.0	
Negative	35	100.0	
Anti-HCV			
Positive	0	00	
Negative	35	100.0	
Body (BMI)			
Body weight			72.74 ± 8.74
Body Height			61.37 ± 2.67

Table 2 showed the status of the risk factors among the participants. In our study, maximum (48.6%) participants had diabetes mellitus (DM) and obesity (42.9%). The HBs Ag and Anti-HCV was negative among all participants. Their mean body weight was 72.74 ± 8.74 and mean body height was 61.37 ± 2.67.

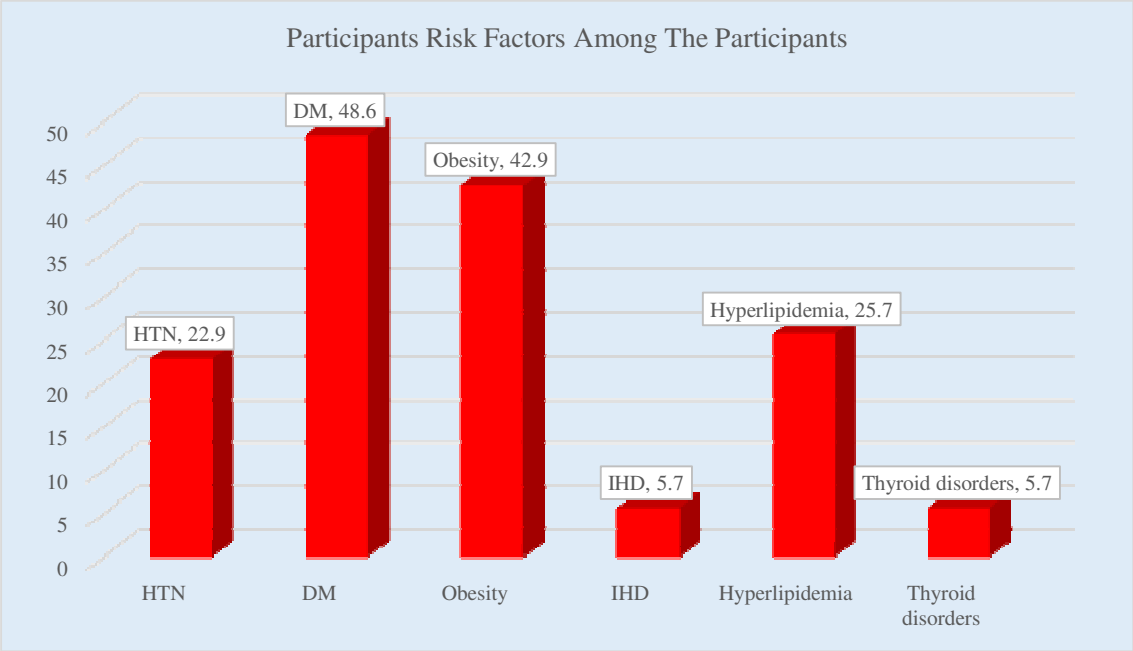

Figure III: Participants Risk Factors Analysis

Table 3: Investigations status of participants (N=35)

Variables	**Mean ± SD**	**95% Confidence Interval of the Difference**		**p-Value**
		Lower	Upper	
S. Bilirubin	0.53 ± 0.20	0.46	0.60	0.544
SGPT	50.89 ± 24.82	42.36	59.41	0.011
SGOT	42.94 ± 23.92	34.73	51.16	0.116
ALK PHOS	56.63 ± 24.98	48.05	65.21	0.968

RBS	6.62 ± 2.99	5.60	7.65	0.231
HBA1C	5.58 ± 1.75	4.98	6.18	0.243
TSH	2.40 ± 1.33	1.94	2.85	0.805
Lipid profile C	207.14 ± 56.82	187.63	226.66	0.161
Lipid profile H	42.97 ± 10.72	39.29	46.65	0.084
Lipid profile L	120.09 ± 45.91	104.32	135.85	0.137
Lipid profile T	214.54 ± 108.25	177.36	251.73	0.937

Table 3 showed the status of the investigations done among the participants. The mean amount of S. Bilirubin, SGPT, SGOT, ALK PHOS, RBS, HBA1C, TSH, Lipid profile C, Lipid profile H, Lipid profile L and Lipid profile T.

Table 3A: SGPT Distribution of participants (N=35)

Variables	**n**	**%**
SGPT <42	21	60.0
SGPT >42	14	40.0

Table 3 A showed, among 35 participants 60% was SGPT <42 and rest 40% was SGPT >42.

Table 4: Hepatic fibrosis status among the participants (N=35)

Hepatic Fibrosis	**Fatty liver score**	
	n	%
Mild (1-8.6) [stage 0, 1]	32	94.4
Moderate (8.6-11.7) [stage 2,3]	2	5.7
Sever (11.7-75) [stage 4]	1	2.9

In the table 4 showed about 40% of the study had NASH i.e. SGPT >42 who were proved to develop cirrhosis or HCC.

Table 5: Hepatic s*teatosis* status among the participants (N=35)

Hepatic S*teatosis(Fat content in liver)*	**Fatty liver score**	
	n	%
Mild (1-270) [stage 0, 1]	4	11.4
Moderate (270-302) [stage 2]	11	31.4
Sever (302-400)) [stage 3]	20	57.2

Table 5 showed that among total participants more than fifty percent *(57.2%) was in stage four of sever.*

Table 6: Fibro scan of liver CAP status of participants (N=35)

Variables	**Odds ratio**	**95% Confidence Interval of the Difference**		**p-Value**
		Lower	Upper	
Stiffness of liver CAP	0.75	0.50	1.12	0.159
Fibro scan of liver CAP	1.00	0.98	1.03	0.963

In the table 6, it showed the fibro scan of liver CAP status of the participants. Here, the odds ratio of the stiffness of liver CAP was 0.75 and the odds ratio of fibro scan of liver CAP was 1.00.

DISCUSSION

Non-alcoholic fatty liver disease (NAFLD) is the most devastating liver condition and the leading cause of cirrhosis in type 2 diabetics.[15, 16]. The findings of NAFLD in various sexes are inconclusive. According to some sources, women have a higher prevalence than men, although newer research have found an even distribution.[17] Fatty liver disease affects more women than men, according to the gender distribution of the current study. Obesity and diabetes mellitus have been identified as major risk factors for NAFLD. A fatty liver condition in type 2 diabetic patients was found to be substantially associated with BMI in numerous studies.[17] Fat deposits around the liver tissue as a result of liver failure, leading in fatty liver disease, which can cause a rise or reduction in liver enzymes. Liver Function Tests are one of the most important indicators of the presence of NAFLD (LFTs). In diabetic patients, it is expected that patients with NAFLD will have more abnormal liver function tests than those who do not have NAFLD.18 Bilirubin also possesses antioxidative and cytoprotective properties.[19] According to the findings, bilirubin has an inverse relationship with nonalcoholic fatty liver disease.[20] NAFLD affects one out of every three people in Bangladesh. It outlines the country's alarming NAFLD pandemic and emphasizes the risk of increased liver-related morbidity and mortality. This is in line with the global trend of fatty liver disease, and it also supports the evidence of rising NAFLD prevalence in this region.[11] Despite having a comparable sociocultural background, the nearby Indian state of West Bengal has a prevalence of around 8-9%, according to a prior study.[12] Our research looked at a higher prevalence of NAFLD, which was explained by a global trend of higher prevalence, increased awareness of sonographic detection for NAFLD, recent economic growth with lifestyle changes, and Bangladeshi women's religious conservatism. This study discovered a number of risk factors for NAFLD. Hypertension, diabetes, obesity, IHD, hyperlipidemia, thyroid problems, and other conditions were more common in people with NAFLD. In addition, being older is a powerful and independent risk factor for NAFLD. NAFLD is thought to be a condition that primarily affects people in their forties and fifties. According to studies, fatty alterations in the liver increase with age[17]. Our findings are also consistent with previous research showing that the highest frequency occurs in persons aged 40-60. This, however, contradicts the findings of numerous research, which show that older people are more susceptible to developing fatty liver disease and its repercussions.[19] NAFLD has a strong link to diabetes mellitus and a higher BMI, according to prior research findings (overweight and obesity). NAFLD is regarded as the hepatic component of metabolic syndrome, and there is more evidence linking it to diabetes mellitus.[20] Diabetes has been discovered to be an independent predictor of NAFLD. The majority of patients with NAFLD are overweight or obese.[21] Our findings indicated that people with NFALD are more likely to be overweight or obese, suggesting that BMI is a strong predictor of NAFLD.[21] NAFLD may affect slim or normal people, especially Asians, according to developing but limited research. The frequency of NAFLD among slim individuals in Asian nations such as South Korea, Japan, and India varies from 12 % to 20 %, and our findings support this.[22] Women are at a higher risk of getting NAFLD, according to our findings. According to findings from several research, men are more likely than women to acquire NAFLD.[23, 24] A female prevalence of

fatty liver has been documented in Bangladesh, according to several hospital-based research.[22, 24] Women in rural areas are more likely to stay at home due to social conservativeness, leading to a sedentary lifestyle. This could explain why women are more likely to develop NAFLD in rural regions.[22]

CONCLUSION

NAFLD is a progressive disease. Its leads to NASH in 20%-30% cases over a period of time. Between those 10-20% leads to liver cirrhosis. And the liver cirrhosis 5-10% leads to *Hepatocellular carcinoma* (HCC). Understanding the full burden of NAFLD in underdeveloped nations is critical. NAFLD affects a large portion of the Bangladeshi population, and its prevalence is higher than in adjacent nations, putting this group at a higher risk of liver-related morbidity and mortality. Adults in their early to mid-thirties, diabetics, and obese people, as well as women, are at a higher risk of having NAFLD than others. NAFLD does not discriminate between young and nonobese people. The study's modifiable risk variables may aid in the development of practical strategies for the early detection and management of NAFLD. The study's modifiable risk variables may aid in the development of practical strategies for the early detection and management of NAFLD. It will also lead to the formulation and implementation of national programs to prevent NAFLD and control the risk factors that come with it.

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