

Incidence and Risk Factors of Non-Alcoholic Fatty Liver Disease among Non-Obese Patients Attending at Department of Gastroenterology, BSMMU

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Abstract:

Introduction: Non-alcoholic fatty liver disease (NAFLD) is a distinct clinicopathologic entity characterized histologically by a spectrum ranging from simple steatosis to steatohepatitis (NASH), cirrhosis and even hepatocellular carcinoma (HCC).

Objective: To determine the incidence and identify the risk factors of NAFLD in non-obese patients.

Methods: It was a cross sectional study done in Department of gastroenterology, Nuclear Medicine and ultrasound, Radiology and Imaging, Virology, Biochemistry, BSMMU, Dhaka from March 2012 to June 2014. The patients more or equal to 18 years, non-obese were included. In this study total 190 patients were enrolled.

Results: Among them 38 patients were with fatty liver and 152 patients without fatty liver on the basis of ultrasonogram. Where 141 were male and 49 were female with mean age was 49.24 + 9.05 years. Among total, 18.9% had diabetes mellitus, 28.4% had dyslipidaemia 24.4% had history of hypertension. Total 18.9% patients having history of diabetes mellitus, normal vs fatty liver disease (20% vs 42.1%, $p < 0.001$) and history of dyslipidemia (10.5% vs 100%, $p < 0.001$), Haemoglobin percentage was 12.16 + 1.32 gm/dL, urine routine microscopic examination glucose present in 9.5% patients. SGPT 56.34 + 16.09 IU/L, SGOT 41.62 + 5.94 IU/L, alkaline phosphatase 99.31 + 19.76 IU/L. We found 6.3% patients were HBsAg positive and no patient was Anti HCV positive.

Conclusion: Sedentary life style, Metabolic syndrome, DM, dyslipidemia, are risk factors of NAFLD in non obese person. Elevated liver enzymes are consequences of NAFLD. Though this study has some limitations, it will give some information about emerging liver disease without viral hepatitis.

Key words: Non-alcoholic fatty liver disease, Dyslipidemia, Diabetes mellitus, Steatohepatitis

Introduction:

Non-alcoholic fatty liver disease (NAFLD) is highly prevalent in Western countries.¹⁻³ It is often linked to obesity and the presence of metabolic syndrome (MS). NAFLD is a distinct clinicopathologic entity characterized histologically by a spectrum ranging from simple steatosis to steatohepatitis (NASH), cirrhosis and even hepatocellular carcinoma (HCC).^{1,4,5}

With the introduction of westernized lifestyle and the increasing frequencies of obesity in the Asia-Pacific region,

the prevalence of NAFLD has increased over the past two decades.⁶⁻⁹ NAFLD has widely been considered a manifestation of metabolic syndrome in close relation to obesity¹⁰⁻¹¹.

Materials and Methods:

It was a cross sectional study done in Department of gastroenterology, Nuclear Medicine and ultrasound, Radiology and Imaging, Virology, Biochemistry BSMMU, Dhaka from March 2012 to June 2014. Patients attending in inpatient and outpatient department of Gastroenterology, BSMMU were enrolled for the study. The patients were more or equal to 18 years, non-obese [BMI (Body mass index) < 25] and gave consent for participating the study procedure. But the patients who were obese and consumed any amount of alcohol were not included. Subjects with the above criteria were sent for investigations for determination of risk factors of NAFLD by using the data collection form. The research was approved by the Ethical Review Committee of BSMMU, Dhaka. Data from the study was analyzed using SPSS (version 20) program.

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Results:**Demographic characteristics**

Table I
Demographic characteristics of 190 patients with or without fatty liver

Variable	All, N=190		Fatty liver N=38	Without Fatty Liver, N=152	P – value
	Mean ± SD		Mean ± SD	Mean ± SD	
Address(N)	Rural/Urban	89/101	21/17	68/84	0.247
Age(Year)		49.24 ± 9.05	44.18 ± 9.05	50.50 ± 8.63	<0.001*
Sex	Male/Female	141/49	26/12	115/37	0.364
Life style	Sedentary/Active	42/148	22/16	20/132	<0.001*

In our study total 190 patients were enrolled. Among them 38 patients were with fatty liver and 152 patients without fatty liver on the basis of ultrasonogram.

Medical history:

Table II
Shows the comparisons in main clinical characteristics between normal and fatty liver disease.

Variable	All N=190		Fatty liver N=38	Without Fatty Liver N=152	P – value
	Mean±SD		Mean±SD	Mean±SD	
DM		18.9%	42.1%	20%	<0.001*
Dyslipidaemia	28.4%	100%	10.5%	<0.001*	
Hypertension	24.4%	26%	23.7%	0.736	
Smoking	36%	18.4%	40.5%	<0.011*	
Change of Wt.	14.7%	42%	7.9%	<0.001*	

Among 190 patients, 18.9% had diabetes mellitus. 28.4% dyslipidemia, 24.4% hypertension. Multiple factors differ significantly between these two groups. Total 18.9% patients having diabetes mellitus, normal vs fatty liver (20% vs 42.1%), and dyslipidemia 10.5% vs 100%, weight change 7.9% vs 42%.

Anthropometric characteristics

Table III
Anthropometric characteristics of fatty liver and without fatty liver patients.

Variable	All, N=190	Fatty liver, N=38	Without Fatty Liver, N=152	P – value
	Mean ± SD	Mean ± SD	Mean ± SD	
SBP	125.37 ± 5.69	125.66 ± 5.77	124.21 ± 5.26	0.143
DBP	81.95 ± 3.96	81.97±4.02	81.95±3.77	0.970
Waist circumference	75.68 ± 7.75	76.29 ± 7.44	73.26 ± 8.55	0.051
Hip circumference	84.71± 8.23	85.42 ± 8.04	81.87 ± 8.47	0.023*
Height	1.60 ± 0.06	1.60 ± 0.06	1.57 ± 0.97	0.053
Weight	55.16 ± 5.63	55.67± 5.02	53.13 ± 7.34	0.050

Laboratory characteristics

Table IV
Laboratory characteristics in fatty liver and without fatty liver patients

Variable	All	Fatty liver	Without Fatty Liver	P – value
	N=190	N=38	N=152	
	Mean ± SD	Mean ± SD	Mean ± SD	
Hb%	12.16 ± 1.32	11.11 ± 1.84	12.43 ± 1.01	<0.001*
PC	263.16 ± 55.92	248.42 ± 55.77	266.84 ± 55.53	0.074
ESR	11.02 ± 6.17	10.55 ± 4.50	11.13 ± 6.53	0.523
Urine R/E- Sugar	9.5%	26.3%	5.3%	<0.001*
FBS	5.30 ± 0.41	5.42 ± 0.52	5.27 ± 0.37	0.117
2HABF	7.21 ± 1.13	7.67 ± 1.67	7.09 ± 0.92	0.043*
Cholesterol	192.28 ± 31.04	234.05 ± 21.142	181.84 ± 23.41	<0.001*
LDL	130.13 ± 31.766	172.00 ± 24.59	119.66 ± 23.73	<0.001*
HDL	35.79 ± 2.13	34.84 ± 1.76	36.03 ± 2.15	0.001*
TG	177.86 ± 57.74	158.26 ± 67.79	157.76 ± 31.83	<0.001*
S.Bilirubin	1.016 ± 0.10	1.01 ± 0.09	1.01 ± 0.70	0.888
SGPT	56.34 ± 16.09	84.34 ± 11.08	49.34 ± 6.88	<0.001*
SGOT	41.62 ± 5.94	48.76 ± 4.68	39.58 ± 4.24	<0.001*
AP	99.31 ± 19.76	105.47 ± 10.17	97.76 ± 21.24	0.002*
PT	11.21 ± 0.50	11.32 ± 0.47	11.18 ± 0.50	0.135
HbsAg	6.3%	0	7.9%	0.074

Table IV shows comparison of Hb% to without fatty liver and fatty liver disease patients (12.43 ± 1.01 vs 11.11 ± 1.84 , $p < 0.001$). Urine routine examination reveals presence of glucose in 26.3% ($p < 0.001$) fatty liver. Serum total cholesterol was significantly high in fatty liver patients, 181.84 ± 23.41 vs 234.05 ± 21.14 ($p < 0.001$), Serum triglyceride significantly high in fatty liver patients 157.76 ± 31.83 vs 158.26 ± 67.79 gm/dl ($p < 0.001$), LDL cholesterol significantly high in fatty liver patients, 119.66 ± 23.73 vs 172 ± 24.59 ($p < 0.001$), HDL cholesterol significantly low in fatty liver patients 36.03 ± 2.15 vs 34.84 ± 1.76 mg/dl ($p < 0.001$), SGPT was significantly high in fatty liver patients, 49.34 ± 6.88 vs 84.34 ± 11.08 , SGOT was significantly high in fatty liver patients, 39.58 ± 4.24 vs 48.76 ± 4.68 IU/L ($p < 0.001$), Alkaline phosphates significantly more in fatty liver patients.

Discussion

This study showed that 38 (20%) persons had NAFLD among 190 non obese patients attending the department of Gastroenterology, BSMMU. In India, there are several

studies about NAFLD among nonobese person. It varied from 11 % to 31.7¹². But Margaritiet al¹³ in Greece found that NAFLD was about 12.5%. Kim HJet al¹⁴ in Korea found that 23.4% had NAFLD in nonobese individual. In Bangladesh Alamet al.¹⁵ found that 25.6% patient had NAFLD among nonobese persons. The difference between this study and other studies may be due to some food habit, life style and ethnic background; and liver biopsy was not done in this study.

In this study, sedentary people had significant ($P < 0.001$) NAFLD than active worker. Total 18.9% having history of diabetes mellitus, normal vs fatty liver disease 20% vs 42.1% ($p < 0.001$) and history of dyslipidemia 10.5% vs 100%, $p < 0.001$, history of weight change 7.9% vs 42% ($p < 0.001$). In a population-based study by Kumar R et al¹⁶ from rural India, 52% of individuals with NAFLD were lean ($BMI < 23$). Interestingly, Das *et al.*¹² also found that individuals with normal BMI had two-fold increases in risk for NAFLD than those with a $BMI < 18.5$ Kg/m². The prevalence of dyslipidemia and MS were significantly higher in lean NAFLD. BMI and abdominal obesity correlated with each

other. A smaller Waist circumference was also reported in nonobese NAFLD previously. Visceral adipose tissues of lean NAFLD may be metabolically more active conferring metabolic risks leading to NAFLD. Both SGPT, SGO Tare statistically significant ($P < 0.001$) in nonobese person. But other study in Bangladesh by Alam S et al.¹⁵ does not support the relation of SGPT and SGOT in case of non obese NAFLD patient. Serum total cholesterol, serum triglyceride, LDL cholesterol, HDL cholesterol were significantly changed in fatty liver. Serum profile level gives the similar result of Kumar R et al.¹⁶ al but differs from the study of Alam S. et.al¹⁵

Conclusion

This is a small scale study based on the patients attending into tertiary centre, BSMMU. Non-alcoholic fatty liver disease (NAFLD) is a metabolic disorder originally assumed to be largely confined to residents of affluent, industrialized Western countries. In particular, there has been an upsurge in obesity-related metabolic syndrome in Asia–Pacific region. In this study, 20% patients had NAFLD on ultrasound finding which is very similar to the study of India, Southeast Asia and even in some western countries. Sedentary life style, Metabolic syndrome, DM, dyslipidameia, are risk factors of NAFLD in non obese person. Elevated liver enzymes are consequences of NAFLD. Though this study has some limitations, it will give some information about emerging liver disease without viral hepatitis. As NAFLD number in nonobese person is increasing day by day, further study may be conducted to explore more information.

Conflict of Interest: None

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