

## Is Westernised Life Style Dominant Cause of NAFLD in Old Dhaka City?

**Md Fazal Karim<sup>1\*</sup> and Salimur Rahman<sup>2</sup>**

<sup>1</sup>Department of Hepatology, Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh

<sup>2</sup>Department of Hepatology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

**\*Corresponding Author:** Md Fazal Karim, Associate Professor and Head, Department of Hepatology, Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh.

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### Abstract

**Introduction:** Non-alcoholic Fatty Liver Disease (NAFLD) is an emerging problem in Bangladesh. Its etiology in old part of Dhaka city is less-explored where it is frequently diagnosed in most of patients coming for abdominal fullness or pain.

**Methodology:** A perspective randomized study was done on fatty liver patients. These patients were compared to control to explore risk factors.

**Result:** Most of NAFLD patients were comparatively young with mean age of presentation 35.5 years. Both males and females were affected. Male persons were found more to have fatty liver. It was also frequent among non-obese persons [15.8% having Waist Hip Ratio (WHR) <0.85] Parameters like diabetes, hypertension, dyslipidemia, rice and meat intake were similar in both groups.

**Conclusion:** Other than intake of fast food, taking meal at unusual time may be a factor in fatty liver emergence in old part of Dhaka city. This needs to be explored.

**Keywords:** NAFLD; Dhaka

### Introduction

Bangladesh is a densely populated country in located in South-East Asia. It's per capita income is \$1,610 according to 2017 statistics. Primary source of income in Bangladesh is agricultural products mostly in rural part of the country. But increasingly garments, manufacturing industries, fisheries are becoming main source of income in urban parts of the country. People are migrating to bigger cities for livelihood. So there are changes in life style. Most people can afford to have only two babies. This is because of hardship in life, change in lifestyle and earnings. In many families both husband and wife work together to meet their expenses. So they hardly get time to prepare food. In old part of city the lifestyle is a bit different. Here most of the rich persons are businessman. Their main diet is rice which most of people take at least two times a day in noon and night. Both rich and working persons prefer food from restaurants and street vendors. These foods are rich in cholesterol. Also they prefer rickshaw or car than walking. Most take less food at breakfast and lunch but their dinner is very rich as they take food with all family members after day long work. Dinner is usually very late, sleep at 1 - 2 am, and wake up late in the morning. Some of them have less appetite in the morning because of late night feed. They take breakfast at 11 am, lunch at 4 pm and then dinner at 11:30 to 12 am and the cycle goes on. Biryani, Bakerkhani, Kabab, Halim, Faluda, Puri, Singara are some of the local delicacies which people here prefer and many of the people are delighted to take them at least once or twice in a week. These food items are rich in oil and spices. So obesity is becoming an emerging healthcare problem in old city.

Commonly ultrasonogram examination of liver is done for screening of fatty liver. Sonologic finding of echogenic liver as compared to kidney cortex or spleen is considered as fatty liver. It is sensitive tool for diagnosis. Its sensitivity and specificity are 85 and 94 percent as compared to histology [1]. Waist to hip ratio (WHR) is used as measurement of obesity. It is the ratio of circumference of waist to that of hips. According to World Health Organisation (WHO) protocol the waist circumference is measured at the midpoint between the lower

margin of the last palpable rib and the top of the iliac crest. Hip circumference is measured around the widest part of the buttocks. A WHR value > 0.85 in female and > 0.90 in male is considered as abdominal obesity as per WHO definition.

**Methodology**

A cross sectional study done among patients seeking treatment for fatty liver. The study was conducted in a private clinic of old city between June 2017 to December 2017. The study population comprised of fatty liver patients and control group who are 18 years or above in age. Both case and control were from same region and socioeconomic background. Age and sex were matched. These patients came with complaints of non-specific abdominal or feeling of abdominal fullness. Both diabetic and non-diabetic patients were taken in study. Consent of the patient and control were taken before enrolling them in study. Privacy of data was strictly maintained. Detailed history, clinical examination and investigations patients and control were done in all cases. Waist to hip ratio (WHR) was also measured. The study was approved by Hospital ethical committee prior to recruiting the patients and cases. The clinical data of patients and control were analysis using Mean, standard deviation, ANOVA where applicable.

**Results**

A total 19 patients and 20 healthy controls participated in the study (Table 1). Healthy control did not have fatty liver on ultrasound examination. It was found that fatty liver is not uncommon among males. Here the number of male patients was more than females. Components of metabolic syndrome like diabetes mellitus, dyslipidemia, and hypertension were common in NAFLD group, whereas smoking was predominant in control group. Both groups had habit of doing exercise either occasional or regular. However NAFLD group were doing more warm up, despite that they were unable to reduce abdominal fat and fatty liver. Intake of vegetables was seen in both groups. Intake of meat, milk, rice was similar in both groups. However intake of fast food more than 2 servings in a week was more common in NAFLD group. Smoking was frequent in control group. Waist hip ratio (WHR) of patients and control were also analysed. It was found that 20% of control and 15.8% patients have WHR value < 0.85 (Table 2). 6 patients (31.5%) were diabetic. These patients either did not or occasionally take fast food (5 out of 6 patients) (Table 3).

		Control (N = 20)	Patient (N = 19)	P value
Sex	Male	13	12	0.908
	Female	7	7	
Age (years)	Range	20 - 55	24 - 52	
	Mean ± SD	31.8 ± 8.7	35.5±8.4	0.439
DM		1	6	0.031
Dyslipidemia		2	4	0.031
HTN		1	5	0.013
Smoking		7	1	0.021
Alcohol		0	1	0.311
Exercise (30 min walking per day)		4	8	0.024
Vegetable	Regular ≥ 5 days/weeks	5	3	0.49
	Irregular < 5 days/weeks	13	9	0.279
Milk intake		9	7	0.712
Beef and mutton		15	11	0.371
Oil	Soybean	20	16	0.284
	Sunflower	0	1	
Rice intake	One Time	3	5	0.395
	Two Times	9	8	0.860
	Three Times	8	6	0.595
Fast Food	Regular ≥ 2 days/weeks	0	4	0.031
	Irregular < 2 days/weeks	11	4	0.30

**Table 1:** Demographic data.

	Control	Patient	P value
Minimum	0.77	0.80	
Maximum	1.15	0.99	
Range	0.77-1.15	0.80-0.99	
Mean	0.9255 ± 0.83	0.9039 ± 0.04937	0.252
Male > 0.9 WHR	13 (65%)	10 (52.63%)	
Female >-.85 WHR	03 (15%)	06 (31.57%)	
Male/Female with WHR < 0.85	04 (20%)	03 (15.8%)	

Table 2: WHR (Waist hip ratio).

Parameters	Present	Absent	P value
Hypertension	01	05	0.48
Dyslipidemia	01	05	0.67
Vegetable intake	06	0	0.05
Milk	06	0	0.025
Beef/Mutton intake	02	04	0.11
Fast food intake	01	05	0.08

Table 3: Demographics of diabetic patients with NAFLD.

### Discussion

Fatty liver is a traditionally common among alcoholics. But frequently it was seen that it was not uncommon among non-alcoholics particularly in diabetic persons. Moreover it is more frequent than alcoholic liver disease in this part of the world. Here sedentary life-style and obesity is important causes after excluding diabetes. Different studies reveal obesity as a public health problem worldwide. Bangladesh is a densely populated country located in South-East Asia. With increase in per capita income overnutrition is also becoming more frequent. Prevalence of obesity among middle and upper class people stands at 9 - 11% [2]. The country has also advanced in other aspects like education, sanitation, health. These improvements have led to emergence of this non-communicable disease in addition to existence of infectious diseases. Metabolic diseases are emerging challenges in coming future. Intake of fast food, westernized lifestyles are some of the public health concerns faced by parents. According to a survey conducted in 2013, 98.5% students from private university in Dhaka city prefer fast food and 43.3% of their pocket money is spent on this purpose [3]. Traditional diet of Bangladeshis is rice and fish. The traditional diet has not changed much but intake of this diet is not popular among young, nor do they prefer to do laborious job. Alcoholism is not frequent because of social and religious factors. It is even lower in tribal population [4]. So social and habitual factors are possible risk factors. In Asia-Pacific region, a quarter of general population has NAFLD [5]. The present study reveals predominance of male population having fatty liver probably due to easy access of these persons to fast food. Smoking is frequent in control group.

In Bangladesh perspective studies revealed that among the patients presenting with bright echogenic liver on ultrasonography and elevated liver enzymes without having hepatitis B and hepatitis C infection and history of alcohol consumption are almost certainly to have Nonalcoholic fatty liver disease (NAFLD) specially if they are diabetic, dyslipidaemic and overweight or obese. In a study involving 30 patients with bright liver and elevated liver enzymes it was found that all were having some form of steatohepatitis; 46.7% had mild while 53% had moderate steatohepatitis. Moreover, in that study most of patients were diabetic (90%), dyslipidaemic (80%), overweight (73.4%) and obese (23.3%), which are established risk factors for NAFLD [6].

Here commonly used imaging modality to identify hepatic steatosis was ultrasonography [7]. Ultrasonography has proved to be a sensitive, accurate and convenient diagnostic tool in detecting steatosis, its sensitivity range from 60-94% and its specificity from 84 - 95% [8-12]. When the hepatic steatosis reaches 33%, the detection sensitivity is nearly 100%.

Reports have suggested that the prevalence of NAFLD among Asian Indians is comparable to that seen in the West, and NASH may be present in approximately 20% of these patients, with a 2- to 3-fold increased prevalence in patients with type-2 diabetes [13]. Many small scale studies have been done on the epidemiology of NAFLD in Bangladesh. The average age for NASH patients is 40 - 50 years, and that for NASH-related cirrhosis is 50 - 60 years [14]. Most of our NAFLD patients were comparatively young with age range 24 to 52 years, mean 35.5 years. There is female preponderance in all studies. This may be due to social conservative attitude which keeps most females at home for household activities without outdoor jobs leading to less physical activity, intake of rice in most of meals, fast food, junk food and spicy food on routine diet. However in this study there is male dominance may be due their easy access to fast food. Among NAFLD patients NASH is frequent, responsible for up to 42.4 - 57.3% cases in different studies [15-17]. This high number of NASH in NAFLD is alarming for the country because Bangladesh is already burdened with hepatitis B infection which is mostly responsible for cirrhosis of liver and liver cancer in this country. NASH will add more burden to the problem especially in cases where there is coexistence of both problems. There has indeed been great concern about the impact of this fast growing disease in our part of the world, especially with the recognition that it is not necessarily a benign condition with the evolution in a proportion of cases to liver cirrhosis and cancer [18]. NASH most likely causes approximately 80% of the cases of cryptogenic cirrhosis, which accounts for 10%-20% of all cirrhosis cases [14]. Another peculiarity of fatty liver patient in Bangladesh is prevalence of this disorder among non-obese population also. In our study 15.8% persons with waist to hip ratio (WHR) < 0.85 found to have fatty liver. A similar study among non-obese NAFLD persons revealed 25.6% were non-obese, and 53.1% of non-obese NAFLD had NASH. Though they were non-obese by BMI grade, they were metabolically similar to obese. In that study males were predominant in the non-obese, whereas females in the obese. NASH and fibrosis were similar in the obese and non-obese [19].

### Conclusion

The study is very small, So it is very hard to conclude that westernized lifestyle with fast food alone is responsible for the fatty liver epidemic. Rather sedentary lifestyle, eating in unusual time, less vegetable intake may be the offending agents in old Dhaka. These factors need to be studied and compared with other regions of the country to find out the precipitating factors.

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