



Frequency of Dyslipidaemia among Young Adults (20–40 Years) in a Private Hospital, Dhaka

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ABSTRACT:

Background: Dyslipidaemia, characterized by abnormal lipid metabolism, is a major modifiable risk factor for cardiovascular disease. Although commonly associated with older adults, recent trends indicate an increasing prevalence among younger populations due to changes in lifestyle, diet and physical inactivity. Early identification of lipid abnormalities in young adults is crucial for preventing long-term cardiovascular complications.

Methods: This prospective observational study was conducted in the Biochemistry lab, Insaf Barakah Kidney & General Hospital, Dhaka, Bangladesh, over one year from July 2024 to June 2025. A total of 200 young adults aged 20–40 years undergoing routine health check-ups were included. Individuals with diabetes, hypertension, hepatic or renal disorders, hypothyroidism, pregnancy, or those on lipid-lowering or hormonal medications were excluded. Lipid profiles were analyzed using fasting and random blood samples. Data were processed and analyzed using MS office tools.

Results: Among 200 participants, 57.5% were male and 42.5% female, with the majority (52.5%) aged 30–39 years. The mean total cholesterol was 184.3 ± 46.2 mg/dL, HDL 39.5 ± 9.2 mg/dL, LDL 115.6 ± 37.8 mg/dL and triglycerides 160.9 ± 75.4 mg/dL. Low HDL was the most frequent abnormality (53%), followed by high triglycerides (46%), high total cholesterol (36%) and high LDL (32%). Overall, 74% of participants exhibited at least one lipid abnormality.

Conclusion: The study revealed a high prevalence of dyslipidaemia among young adults in Dhaka, primarily due to low HDL and elevated triglycerides. These findings underscore the need for early lipid screening and lifestyle modification to mitigate future cardiovascular risks.

INTRODUCTION

Dyslipidaemia is a well-recognized metabolic disorder characterized by abnormal levels of one or more lipid parameters in the blood, such as elevated total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), triglycerides (TG), or reduced high-density lipoprotein cholesterol (HDL-C) [1]. It is one of the most important modifiable risk factors for cardiovascular diseases (CVD), which remain the

leading cause of morbidity and mortality globally [1, 2]. Traditionally considered a problem of middle-aged or elderly populations, dyslipidaemia is increasingly being detected among young adults due to changing lifestyles, dietary habits and reduced physical activity. Early identification and management of dyslipidaemia in this age group are therefore essential to prevent future cardiovascular complications [3].



In recent decades, urbanization, sedentary lifestyles and the adoption of Western dietary patterns characterized by high intake of saturated fats, refined carbohydrates and processed foods have contributed to a rising prevalence of lipid abnormalities in South Asian countries [4]. The young adult population (20–40 years) is particularly vulnerable because of increasing exposure to risk factors such as obesity, stress, smoking and lack of exercise [5]. Although these individuals may appear clinically healthy, subclinical dyslipidaemia often goes unnoticed until significant vascular changes or premature coronary artery disease develop. This “silent” progression highlights the importance of routine screening and awareness in apparently healthy young adults [6].

Several studies conducted in Bangladesh have reported a high prevalence of dyslipidaemia, ranging from 60% to 75% among adults, with low HDL-C and elevated triglycerides being the most frequent abnormalities [5, 7]. However, data focusing specifically on the young adult population remain limited. The lipid profile pattern in this age group may differ due to differences in lifestyle, genetic predisposition and hormonal influences [8,9]. Moreover, there is a tendency for young individuals to neglect preventive health measures, leading to delayed diagnosis and management [9]. Understanding the burden and pattern of dyslipidaemia among young adults can therefore provide valuable insights for early intervention and policy formulation [10, 11].

The present study was designed to determine the frequency and pattern of dyslipidaemia among young adults aged 20 to 40 years attending a private hospital in Dhaka. The findings are expected to contribute to the growing body of evidence on early cardiovascular risk factors in young populations and underscore the importance of lifestyle modification and preventive screening at an earlier age.

METHODOLOGY & MATERIALS

This prospective observational study was conducted in the Biochemistry lab, Insaf Barakah

Kidney & General Hospital, Dhaka, Bangladesh, over a one-year period from July 2024 to June 2025. A total of approximately 200 young adults aged between 20 and 40 years who attended the hospital for routine health check-ups or biochemical investigations were enrolled in the study. Inclusion criteria were adults aged 20–40 years of both sexes who consented to participate and had no acute illness at the time of blood sampling. Exclusion criteria included individuals with known diabetes mellitus, hypertension, renal or hepatic disorders, hypothyroidism, pregnancy, or those on lipid-lowering or hormonal medications. Participants were selected using a convenient sampling technique. After obtaining informed consent, demographic data and relevant clinical information were recorded using a structured questionnaire.

Venous blood samples were collected after an overnight fast of 8–12 hours, except for those undergoing random lipid testing. The serum was separated and analyzed for lipid profile parameters including total cholesterol (TC), triglycerides (TG), high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C) using standard enzymatic colorimetric methods in the hospital’s biochemistry laboratory. All assays were performed using an automated chemistry analyzer following standard operating procedures with strict quality control.

The presence of dyslipidaemia was defined according to the National Cholesterol Education Program Adult Treatment Panel III (NCEP-ATP III) guidelines: total cholesterol ≥ 200 mg/dL, LDL-C ≥ 130 mg/dL, triglycerides ≥ 150 mg/dL and HDL-C < 40 mg/dL. Individuals with one or more abnormal lipid parameters were considered to have dyslipidaemia [8].

All collected data were compiled, coded and entered into a computer for analysis. Statistical analysis was performed using the MS office tools. Descriptive statistics such as mean, standard deviation, frequency and percentage were used to summarize the data.



RESULTS

Table 1: Baseline Characteristics of the Study Participants (n = 200)

Variables	Categories	Frequency (n)	Percentage (%)
Age group (years)	20–29	40	20.0
	30–39	105	52.5
	>39	55	27.5
Gender	Male	115	57.5
	Female	85	42.5
Profile type	Fasting	170	85.0
	Random	30	15.0

Table 1 presents the baseline characteristics of the study participants (n = 200). The majority of participants were in the 30–39-year age group (52.5%), followed by those aged above 39 years (27.5%) and 20–29 years (20.0%). Males

constituted a slightly higher proportion of the study population (57.5%) compared to females (42.5%). Most of the lipid profiles were obtained from fasting samples (85.0%), while 15.0% were from random samples.

Table 2: Lipid Profile Parameters of the Participants (n = 200)

Parameter	Mean \pm SD (mg/dL)	Minimum	Maximum
Total Cholesterol	184.3 \pm 46.2	90	310
HDL Cholesterol	39.5 \pm 9.2	25	65
LDL Cholesterol	115.6 \pm 37.8	40	198
Triglycerides	160.9 \pm 75.4	60	310
Cholesterol/HDL Ratio	4.88 \pm 1.28	2.9	7.8

Table 2 shows the lipid profile parameters of the study participants. The mean total cholesterol level was 184.3 \pm 46.2 mg/dL, ranging from 90 to 310 mg/dL. The mean HDL cholesterol was 39.5 \pm 9.2 mg/dL, with values between 25 and 65 mg/dL. The mean LDL cholesterol level was 115.6 \pm 37.8

mg/dL, ranging from 40 to 198 mg/dL, while triglycerides had a mean value of 160.9 \pm 75.4 mg/dL, with a range of 60 to 310 mg/dL. The mean cholesterol/HDL ratio was 4.88 \pm 1.28, varying from 2.9 to 7.8.

Table 3: Prevalence of Lipid Abnormalities (n = 200)

Lipid Abnormality	Criteria	Frequency (n)	Percentage (%)
High Total Cholesterol	\geq 200 mg/dL	72	36
High LDL Cholesterol	\geq 130 mg/dL	64	32
Low HDL	< 40 mg/dL	106	53
High Triglycerides	\geq 150 mg/dL	92	46
Any Dyslipidaemia	\geq 1 abnormal parameter	148	74

Table 3 illustrates the prevalence of lipid abnormalities among the study participants. High total cholesterol (\geq 200 mg/dL) was observed in 36% of individuals, while 32% had elevated LDL cholesterol (\geq 130 mg/dL). Low HDL levels were the most frequent abnormality, affecting 53% of participants, followed by high triglycerides (\geq 150 mg/dL) in 46%. Overall, 74% of the study

population had at least one form of lipid abnormality, indicating a high burden of dyslipidaemia among young adults in this study.

DISCUSSION

This study evaluated the frequency and pattern of dyslipidaemia among young adults aged 20–40 years attending a private hospital in Dhaka,



Bangladesh. The findings revealed that 74% of the participants had at least one lipid abnormality, indicating a high prevalence of dyslipidaemia in this age group. The most common lipid abnormality was low HDL cholesterol (53%), followed by high triglycerides (46%), high total cholesterol (36%) and high LDL cholesterol (32%). These findings reflect an alarming trend of lipid disturbances occurring early in life among urban Bangladeshi adults.

The overall prevalence of dyslipidaemia observed in this study is consistent with several regional and global reports. Arif et al., reported that 67% of young myocardial infarction patients in Pakistan had dyslipidaemia, emphasizing its early onset in South Asian populations [12]. Similarly, Joshi et al., in the ICMR–INDIAB study found that 79% of Indian adults had at least one lipid abnormality, particularly low HDL and high triglycerides [13]. These similarities suggest that South Asian populations, including Bangladesh, share a genetic and lifestyle predisposition toward dyslipidaemia and related cardiovascular risks.

In the current study, the predominance of low HDL levels aligns with findings from multiple Asian studies. Sun et al. and Wang et al., observed that low HDL was the most common lipid abnormality among Chinese adults, occurring in 43–52% of participants [14, 15]. Pan et al., also reported a similar pattern in a nationwide Chinese survey, attributing it to sedentary lifestyles and dietary habits high in carbohydrates and low in healthy fats [16]. This pattern is further supported by Pirillo et al., who emphasized that HDL deficiency is particularly common in developing countries due to poor dietary quality and limited physical activity [17].

The mean lipid values in this study total cholesterol (184.3 ± 46.2 mg/dL), LDL (115.6 ± 37.8 mg/dL), triglycerides (160.9 ± 75.4 mg/dL) and HDL (39.5 ± 9.2 mg/dL) are within borderline ranges, reflecting a population at high risk for future cardiovascular events. Similar trends were observed by Babu Rao et al., who reported mean total cholesterol and triglyceride levels of 190 mg/dL and 165 mg/dL, respectively, among young Indian adults [18]. These comparable results suggest that lifestyle factors such as poor diet,

physical inactivity and rising obesity rates contribute significantly to the dyslipidaemia burden across South Asia.

The absence of a significant gender difference in dyslipidaemia prevalence in our study mirrors the findings of Ali et al., who reported similar patterns among adults in the United Arab Emirates [19]. This suggests that both men and women are equally exposed to urban lifestyle risk factors such as high-calorie diets, stress and lack of exercise. However, hormonal differences and post-pregnancy metabolic changes might explain slightly higher triglyceride and lower HDL tendencies in some female populations, as noted by Bibiloni et al., in Mediterranean adults [20].

The high frequency of dyslipidaemia in this relatively young age group is a cause for concern because lipid abnormalities at a young age are known to accelerate atherosclerosis and increase lifetime cardiovascular risk and renal risk, as dyslipidaemia is also implicated in the progression of chronic kidney disease (CKD). Yandrapalli et al., identified dyslipidaemia as one of the most important modifiable risk factors for myocardial infarction in young adults [21]. Similarly, Jeong et al., demonstrated that even modest increases in total cholesterol among young individuals are strongly associated with future cardiovascular disease events. These observations underscore the importance of early screening and intervention [22].

Socioeconomic and lifestyle transitions in urban Bangladesh such as increased fast-food consumption, reduced physical activity and growing obesity are likely contributors to this rising trend. Comparable observations were made by Opoku et al., in China and Asiki et al., in Uganda, who linked urbanization to worsening lipid profiles and metabolic disorders [23, 24]. Furthermore, Lan et al., highlighted that chronic inflammation combined with atherogenic dyslipidaemia greatly increases the risk of type 2 diabetes among young adults, emphasizing the interconnected nature of metabolic diseases [25].

The findings of the present study highlight an urgent public health need for preventive strategies. Routine lipid screening should be incorporated into



regular health checkups, especially for individuals with sedentary habits or positive family histories. Lifestyle modification including dietary adjustments, physical exercise and weight management—remains the cornerstone for dyslipidaemia prevention and control, as supported by global recommendations from Pirillo et al. and the World Health Organization [2, 17].

Limitations of the study

This study had several limitations. Being a single-center prospective observational study with a relatively small sample size, the findings may not represent the broader Bangladeshi young adult population. The study relied on hospital-based participants, which could introduce selection bias, as individuals attending hospitals may have higher health concerns or pre-existing risk factors. Additionally, lifestyle factors such as diet, physical activity, smoking and family history were not assessed, limiting the ability to identify underlying causes of dyslipidaemia. Lastly, the lack of longitudinal follow-up prevents evaluation of long-term cardiovascular outcomes associated with these lipid abnormalities.

CONCLUSION

In conclusion, this study demonstrates that dyslipidaemia is highly prevalent among young adults in Dhaka, with low HDL and high triglycerides being the most common abnormalities. These results are consistent with findings from other Asian and global studies and point to the urgent need for awareness, early screening and preventive interventions to curb future cardiovascular disease in this vulnerable population.

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