JOURNAL OF SCIENTIFIC RESEARCH IN ALLIED SCIENCES

Contents available at: www.jusres.com

RISK FACTORS AND LIPID PROFILES OF PATIENTS WITH CARDIOVASCULAR DISEASES: A MULTI CENTRE STUDY IN DHAKA, BANGLADESH.

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

Article History
Received: March 2022
Accepted: June 2022
Keywords: Risk Factors, Lipid Profiles, Cardiovascular Diseases

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Introduction: The relative importance of various risk factors varies in Bangladesh. This was a retrospective study of patients with recently diagnosed coronary artery disease to assess four major risk factors: dyslipidemia, hypertension, smoking, and diabetes.

Aim of the study: The aim of the study was to investigate the prevalence of risk factors and the lipid profiles of Cardiovascular Diseases at some private hospital in Dhaka, Bangladesh.

Methods: This is a prospective observational study; a total of 127 patients were enrolled and analyzed in this study. The study conducted during June 2020 to July 2021 at the Department of Cardiology in some Private Hospital in Dhaka, Bangladesh.

Result: The demonstrates the associated risk factors of the study; 65(51.18%) patients had a history of hypertension, and 53(41.73%) patients had a history of diabetes. the physical activity of the study population; 65% of patients were heavy workers, 55% of patients were working 5-10 hours per day, and only 4(3.15%) patients had physical activity in games. According to the dietary pattern of the study, 55% of patients were taking vegetables more than four days per week, and 65% were taking fruits less than four per week.

Conclusion: Among the risk factors assessed, dyslipidemia (particularly abnormal TC/HDL ratio and elevated LDL cholesterol), smoking hypertension, and diabetes were associated with coronary artery disease in decreasing order of prevalence. Dyslipidemia and (in males) smoking are particularly important in premature CAD.

INTRODUCTION:

Conventional cardiovascular risk factors, such as hypertension, diabetes, smoking, and dyslipidemia, increase the risk of developing coronary artery disease (CAD) [1, 2]. Primary prevention studies have shown that the early detection and aggressive treatment of risk factors prevent cardiovascular events [3, 4]. The INTERHEART study was designed to assess the relevance of different risk factors on myocardial infarct development worldwide [5]. The analysis of 14 international clinical studies of patients with the acute coronary syndrome (ACS) revealed that 85% had at least one of the conventional risk factors [6]. The relationship between lipid profile and obstructive disease in coronary arteries is well known. Data from the OPERA registry suggests that in patients with different ACS, untreated dyslipidemia was the strongest predictor of in-hospital death [7]. It has been recognized that alterations in lipid levels, consisting of reductions in total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), and high-density lipoprotein cholesterol (HDL-C) and increases in triglycerides (TG), occur after an ACS [8]. Accurate knowledge of baseline lipid levels may affect the initiation of lipid-lowering therapy and the patient's willingness to adhere to long-term lipid-lowering therapy recommendations. Although strong associations exist between risk factors and the occurrence of CAD, angiographic studies in patients without ACS have shown conflicting results between the correlation of risk factors and the severity of coronary atherosclerosis [9, 10]. Previous reports of the prevalence of the risk factors and lipid profiles in ACS have been done in patients without considering the presence or absence of coronary lesions. Our study aimed to investigate the prevalence of risk factors and the lipid profiles of Cardiovascular Diseases at some private hospital in Dhaka, Bangladesh.

METHODOLOGY & MATERIALS

This is a prospective observational study; a total of 127 patients were enrolled and analyzed in this study. The study conducted during June 2020 to July 2021 at the Department of Cardiology in some Private Hospital in Dhaka, Bangladesh. However, 23 patients were excluded from the study because they did not fulfil the study criteria. Thus, a total of 127 patients were included in the study. Patients not willing to participate and those with diagnosed cardiovascular disease (based on documentary evidence) were excluded.

Inclusion criteria:

- Patients aged >30 years old.
- Patients diagnosed with cardiovascular disease.

Exclusion criteria:

- Patients who received health education and advice from doctors following their diagnosis of cardiovascular diseases by changing their lifestyle, dietary habits, and physical activity practices.

Cardiovascular diseases encompassing coronary heart disease, angina pectoris, hypertension, myocardial infection, cerebrovascular disease (stroke), and congestive heart failure (excluding organic and congenital cardiovascular disease) were considered in this study. Although hypertension is a cardiovascular disease, it is also one of the most critical risk factors for other cardiovascular diseases. So, it has been included in the list of risk factors measured during the study. The following tools were used during the study: a pre-designed, semi-structured questionnaire, a Mercury sphygmomanometer, measuring tape, and a weighing machine. Informed consent was obtained from each respondent before the interview and physical examination. The same instruments were used for measuring the different health parameters to maintain uniformity. Only proven risk factors, as obtained by the review of literature, were taken for the study [3]. The risk factors for physical activity and dietary patterns were taken from the standard Integrated Disease Surveillance Program questionnaire. In contrast, the scoring for these risk factors was done by the researchers themselves. These risk factors' prevalence and association with different

sociodemographic variables like age, sex, literacy status, and per capita monthly income were analyzed. All data were presented in a suitable table or graph according to their affinity. A description of each table and graph was given to understand them clearly. All statistical analysis was performed using the statistical package for the social science (SPSS) program and Windows. Continuous parameters were expressed as mean ±SD and categorical parameters as frequency and percentage. Student's t-test made comparisons between groups (continuous parameters). Categorical parameters compared by Chi-Square test. The significance of the results, as determined by a 95.0% confidence interval and a value of $P<0.05$, was considered to be statistically significant.

RESULT

This is a prospective observational study; 127 patients were enrolled and analyzed. Table 1 shows the study's age distribution; most patients were from the age range of 40-49 years and more than >60 years. The study's male and female ratio was the same (Figure 1). The table demonstrates the associated risk factors of the study; 65(51.18%) patients had a history of hypertension, and 53(41.73%) patients had a history of diabetes. The BMI mean±SD is 20.85±3.66 in the study, and almost 85% of patients were regular smokers (Table 2). Table 3 shows the physical activity of the study population; 65% of patients were heavy workers, 55% of patients were working 5-10 hours per day, and only 4(3.15%) patients had physical activity in games. According to the dietary pattern of the study, 55% of patients were taking vegetables more than four days per week, and 65% were taking fruits less than four per week. Almost 75% of patients took extra salt, and 25% did not (Table 4).

Table 1: Age distribution of the study population (N=127).

Age range	Frequency	Percentage
20-39	23	18.11
40-49	39	30.71
50-59	26	20.47
>60	39	30.71

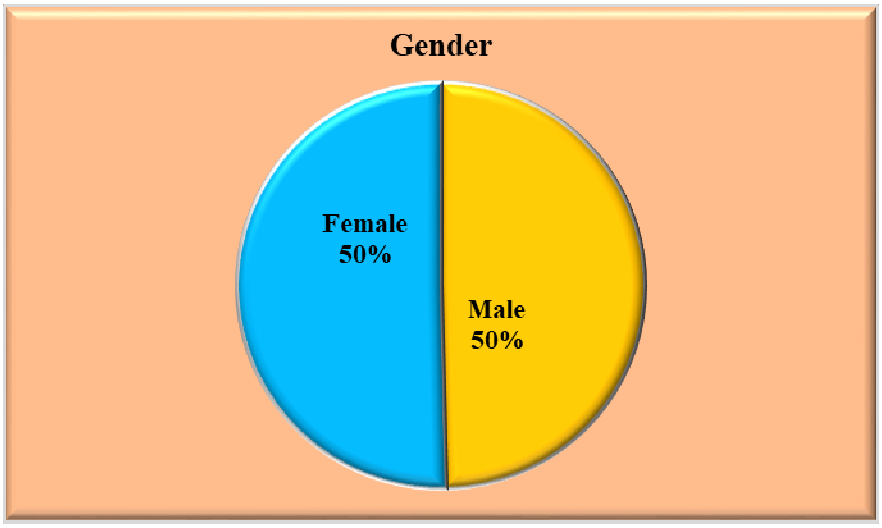

Figure 1: Gender distribution of the study population (N=127).

Table 2: Associated risk factors.

Risk factors	Frequency	Percentage
Personal history		
History of hypertension	65	51.18
History of diabetes	53	41.73
History of stroke	9	7.09
Family history		
Family history of hypertension	72	56.69
Family history of diabetes	55	43.31
Smoking		
Regular smoker	107	84.25
Tobacco user	7	5.51
Non-smoker	13	10.24
BMI		
Mean±SD	20.85±3.66	
Stage		
Stage I HTN (systolic 140-159 /diastolic 90-99)	53	41.73
Stage II HTN (systolic 160-179 /diastolic 100-109)	47	37.01
Stage III HTN (systolic ≥180 / diastolic ≥110)	27	21.26

Table 3: Physical activity of the study population.

Physical activity	Frequency	Percentage
Nature of work Sedentary		
Moderate	44	34.65
Heavy	83	65.35
The average number of hours spent at work/day		
<5 hours	15	11.81
5-10 hours	70	55.12
>10 hours	42	33.07
Mode of travelling for going to the workplace		
No travel	11	8.66
Sitting in the vehicle/standing	79	62.20
Walking	18	14.17
Cycling	19	14.96
Physical activity not related to work		
No such physical activity	87	68.50
Slow walking	25	19.69
Yoga	5	3.94
Cycling	6	4.72
Physically active games	4	3.15

Table 4: Dietary pattern of the study population.

Dietary pattern	Frequency	Percentage
Number of days of vegetable intake/week		
<4	57	44.88
≥4	70	55.12
Number of days of fruit intake/week		
<4	83	65.35
≥4	44	34.65
Daily oil consumption/adult consumption unit		
≥20 ml/day	72	56.69
<20 ml/day	55	43.31
Extra salt intake with cooked food		
Yes	95	74.80
No	32	25.20

DISCUSSION

Epidemiological trends indicate that there will be an increase in incidences of cardiovascular diseases worldwide, particularly in developing countries [11, 12, 13]. Accordingly, cardiovascular risk factors have increased among Bangladeshi people in recent years, and mortality from cardiovascular diseases remains the leading cause of death in Bangladesh [14]. Reversing this situation requires adopting preventive measures, which have been extensively shown to be effective in modifying cardiovascular risk factors [15, 16]. Given this, identifying groups with risk factors for cardiovascular diseases is essential for developing effective preventive plans. In agreement with national and international literature, the data from the present study shows a considerable prevalence of cardiovascular risk factors among young adults. Many university students reported a family history of chronic diseases. Several studies have revealed a greater prevalence of cardiovascular risk factors in relatives of individuals with cardiovascular diseases and type 2 diabetes mellitus compared to those without a family history of these diseases [18, 19]. A significant prevalence of smoking and a sedentary lifestyle has been reported in young Bangladeshi adults and the present sample [18,20]. Smoking is one of the most significant risk factors for cardiovascular diseases, and even in young people, a relationship between serum lipoprotein cholesterol concentrations and smoking has been reported [21]. A sedentary lifestyle is an independent risk factor for cardiovascular diseases [11, 22, 23]. Computers occupy a significant part of student's time, and this habit is negatively associated with physical activity [24]. Additionally, the possible reduction in extracurricular activities after entering university contributed to the elevated frequency of physical inactivity. Anthropometric variables have extensively been shown to predict cardiovascular risk [25]. This profile is similar to that found in developed societies and features part of the nutritional transition, which has spread to developing countries [26, 27]. Despite the frequency of students with undesirable serum lipids and inadequate diet composition, we could not observe any association between serum parameters, dietary data, and other cardiovascular risk factors. Intra-individual variability, both in the diet and in serum parameters, has been shown to reduce the possibility of detecting the presence of associations in one population, i.e., associations are more apparent in studies aiming to compare different populations [28]. On the other hand, in this study, BMI showed a directly proportional relationship with total serum cholesterol and LDL-c levels. The greater the BMI, the greater the prevalence of higher than desired values for these parameters, which indicates the importance of this simple and inexpensive anthropometric evaluation. To summarize, an

actual prevalence of cardiovascular risk factors was observed in the university students included in the present study. Considering that some of the cardiovascular risk factors are modifiable by changes in lifestyle, educational programs aimed at motivating the adoption of healthy lifestyle choices would be helpful, especially for upcoming healthcare professionals, as they are the ones who will be taking care of the health of the population in the future.

Limitations of the study: Every hospital-based study has some limitations and the present study undertaken is no exception to this fact. The limitations of the present study are mentioned. Therefore, the results of the present study may not be representative of the whole of the country or the world at large. The number of patients included in the present study was less in comparison to other studies. Because the trial was short, it was difficult to remark on complications and mortality.

CONCLUSION AND RECOMMENDATIONS

Although the absence of well-established disease surveillance mechanisms prevents a precise estimation of the size of cardiovascular disease burdens, the direction of change is clear the burden is rising. Even with the current status of knowledge, however, the magnitude of the problem is large enough to demand urgent attention and action. This study revealed that the risk factors for cardiovascular disease were highly prevalent in the study population, the most striking being obesity (56%) and hypertension as per WHO criteria (46%). The high-risk physical activity score was significantly more in the younger age group and higher income group. A high-risk dietary pattern was seen to be significantly more in the younger age group and the literate group. All the respondents were given health education about ways of preventing cardiovascular diseases. Besides, a session was arranged by the researchers for the health workers to educate them about the various risk factors of cardiovascular diseases and ways to prevent them so that they can inculcate the preventive measures among the people living in the slums during their house-to-house visits. This gains importance especially since many of the risk factors like smoking, obesity, dietary pattern, physical inactivity, etc. are modifiable. Urgent measures based on primordial and primary prevention need to be taken especially from the school level to modify the lifestyle and behavior of the people of the slum community otherwise the epidemic of non-communicable disease may get out of hand.

Conflict of interest: None declared

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