Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Cardiology

Coronary Heart Disease among the Patients of Age between 25-39 and 40-70 Years Attending Cardiology Outdoor of BSMMU, Dhaka, Bangladesh

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DOI: 10.36347/sjams.2023.v11i09.017 | **Received:** 06.08.2023 | **Accepted:** 13.09.2023 | **Published:** 22.09.2023

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Abstract **Original Research Article**

Background: Ischemic heart disease (IHD), also known as Coronary Heart Disease (CHD) is a generic designation for a group of related syndromes resulting from myocardial ischemia. It comprises of stable angina, unstable angina, acute myocardial infarction and sudden death. Since the most common cause of IHD is coronary artery abnormality it is also termed as "Coronary artery disease". ***Method:*** This cross sectional observational study was carried out in the department of Cardiology, UCC, BSMMU, Dhaka, during the period of September 2013 to December 2013. A total of 200 patients with primary diagnosis of CHD who were admitted for coronary angiogram were included in this study considering the inclusion and exclusion criteria. ***Results:*** Patients aged 25 to 40 years were grouped as group A and a 40 to 70 years were grouped as group B. Baseline clinical history, physical examination and investigations including reports of coronary angiogram were recorded accordingly. There were significant differences between two groups in respect to risk factors and angiographic findings. The prevalence of hypertension and diabetes were found to be more among group B CHD patients compare to group A patient ($p<0.001$) while, smoking and positive family history of IHD were more prevalent in younger age group ($p<0.05$). Normal or non-significant CAG findings were more common among group A compared to group B ($p<0.05$). Multiple vessel disease was observed to be more common amongst group B CHD patients ($p<0.01$). LAD and RCA involvement was more frequent in group B compared to group A patient ($p<0.01$). This indicated that risk factors and disease severity was different between two groups. In both the groups male predominance was observed but it was not different between two groups. Other risk factors like obesity and dyslipidemia were not found to be different. ***Conclusion:*** Even with best possible effort some limitations have been encountered in this study. Emerging risk factors we discussed earlier, are currently gaining much attention in pathogenesis in young CHD patients. This study could not assess these parameters.

Keywords: Ischemic heart disease (IHD), Coronary Heart Disease (CHD), Acute myocardial infarction.

INTRODUCTION

Ischemic heart disease (IHD), also known as Coronary Heart Disease (CHD) is a generic designation for a group of related syndromes resulting from myocardial ischemia [1]. It comprises of stable angina, unstable angina, acute myocardial infarction and sudden death. Since the most common cause of IHD is coronary artery abnormality it is also termed as "Coronary artery disease". Main pathology resides in coronary arteries as plaques of athermanous deposit [2]. Atherosclerosis leading to Coronary Heart Disease (CHD) is complex in origin. Involved in the pathogenesis of atherosclerosis are hemodynamic, thrombotic, carbohydrate-lipid metabolic variables along with intrinsic characterization of arterial wall. These physiologic and biochemical factor underlie the clinical events that may eventually occur. Environmental factors such as smoking and sedentary life style also contribute to this process. A number of risk factors have been identified in causation of CHD. The probability of developing CHD and progression in severity relate not only to the presence and extent of cardiovascular risk factor but also to the persistence of risk factors over time [3]. CHD is a major cause of morbidity and mortality in the developed countries and its prevalence is rising in the developing countries [4]. Though its prevalence is higher in developed countries, it has gained considerable attention in developing countries due to its rising trend and change in life style of the urban population. It is mainly a disease of elderly but young people are not immune either. When it occurs below 65 years in women and 55 years in men

it is called Premature Coronary Artery Disease (CAD). CHD occurring at age below 40 years is termed coronary artery disease in young. [5] CHD has more impact on livelihood when it affects young people. It has devastating effect in this age group as they are the most economically productive ones. Prevalence of CHD varies in different parts of world. Over all its impact is more in the developed countries compared to the developing ones. But CHD in young people is found to be more frequent in developing countries especially those of Indian sub origin. Studies done in India showed that about 70% of patient from Calcutta & 97% patients from Madras were <60 years [6]. Another report from Madras found that 10% of MI patient undergoing catheterization for angina pectoris was 27-40 years old with mean age of 38 [7]. On the contrary prevalence of CAD in young American population was <2%. Young CHD was also seen to be more frequent among Indian immigrants residing in America compared to the local natives [8]. Bangladesh is not an exception. All types of cardiovascular diseases are prevalent in Bangladesh as in other parts of the world. Incidence of IHD in Bangladesh was reported to be 3.3/1000 populations in the year 1975 and that in 1985 it was 14/1000 while in the year 2002 it was about 10% adult population [9]. Cardiovascular diseases are one of the leading emerging problems in developing countries like Bangladesh as evident from analysis of patients from 1981 to 1989 at National Institute of Cardiovascular Disease (NICVD). [10] In another survey, it was 17.68% of cardiac patients in a general hospital. Among the hospitalized patients in NICVD, IHD patients were 56% [11]. Incidence of IHD is also increasing in developing countries including Bangladesh with the improvement of socioeconomic status, urbanization and changes of dietary habits and lifestyle [12]. Among different patterns of IHD, though, no definite prevalence data is available about the incidence of unstable angina (UA) in Bangladesh, but in recent times, UA has emerged as a dominant cause of hospital admission morbidity and mortality due to CAD in our country [13]. Acute Myocardial Infarction is the leading cause of death in Bangladesh in fourth decade of life [14]. Previous studies done over last two decades showed that the epidemiology of young patients with CHD differs in many aspects from those in old though they both share a common denominator. The risk factors and their relative frequency varied in between these two groups and so did the severity of disease and the prognosis [15]. Association of risk factors with causation of coronary artery disease in young population also appears to be stronger compared to elderly. This is true particularly with regards to certain specific risk factors like body mass index (BMI), Raised blood pressure (BP), low density lipoprotein (LDL), triglyceride (TG), smoking and family history. Studies showed CHD in young had stronger association with smoking, hyperlipidemia and a positive family history compared to diabetes and hypertension [16]. The extent of disease and severity was also less in younger patients with comparatively fewer number of coronary arteries affected [17]. No such study has been done in Bangladesh and those issues still remain "stones unturned". This entity appears to be more common in developing countries like ours, hits the most productive age group and possibly be preventable by identifying risk factors that have strong influence on its development. It seems worthwhile studying epidemiological risk factors in young CHD patients and comparing those with older patients with CHD in Bangladesh. Differences observed can be used for better understanding of risk factors among young CHD patients in our context and to prioritize therapeutic as well as community intervention.

OBJECTIVES

General Objectives:

To assess and compare risk factors and Coronary Heart Disease severity in between two groups.

Specific Objectives:

- To identify the traditional/emerging risk factors of age between 25 to 70 years of CHD patients.
- To assess the pattern of involvement of coronary arteries in age between 25 to 70 years of CHD patients.

METHODOLOGY

It was a Cross-sectional, Observational & Comparative study. The patients were selected purposively. A total of 200 patients were included in this study in two groups. The study was conducted in the Department of cardiology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh at September 2013 to December 2013 (04 months).

Inclusion criteria:

- Age between 25-70 years.
- Primary diagnosis of CHD.

Exclusion criteria:

- Patients outside Dhaka.
- Renal Impairment.
- Unwilling to undergo producer.
- Previous CABG or PTCA done.

Data management & analysis

After collection of data, all responses checked for their completeness, correctness and internal consistency in order to exclude missing or inconsistent data. Corrected data was entered into the computer. The data was analyzed by using the statistical software namely SPSS version 23.0. Data analysis was done according to the objectives of the study. P-value more than 0.05 was considered insignificant.

Ethical clearance

Ethical clearance was taken from the Ethical Review committee of University of South Asia. Prior

permission and inform written consents was taken from each respondent.

RESULTS

A total of 200 coronary heart disease (CHD) patients selected for the study. Of them 100 patients were assigned to Group A (25-39 years) and 100 to Group B (40-70 years). The age of the study population ranges from 25 to 70 years with mean age of 43.6±10.6 years. The purpose of the study was to compare the risk factors and disease severity between two groups. The findings of the study obtained from data analysis are presented below.

Table 1: Distribution of the respondents by age, (N=200)

Age (years)	Frequency (n)	Percentage (%)
<30 yrs.	6	3.0
30-39 yrs.	94	47.0
30-49 yrs.	38	19.0
50-59 yrs.	38	19.0
≥ 60 yrs.	24	12.0

Table 1 showed age group ranges from 25 to 70 years with mean age of 43.6±10.6 years. In group A (25-39 years) distribution shows that 47% were between 30-39 years and 3% were below 30 years. In group B (40-70 years) 38% were between 40-59 years and 12% were 60 or above 60 years old. The mean age was 43.6±10.6 years and the lowest and highest ages were 25 & 70 years' old.

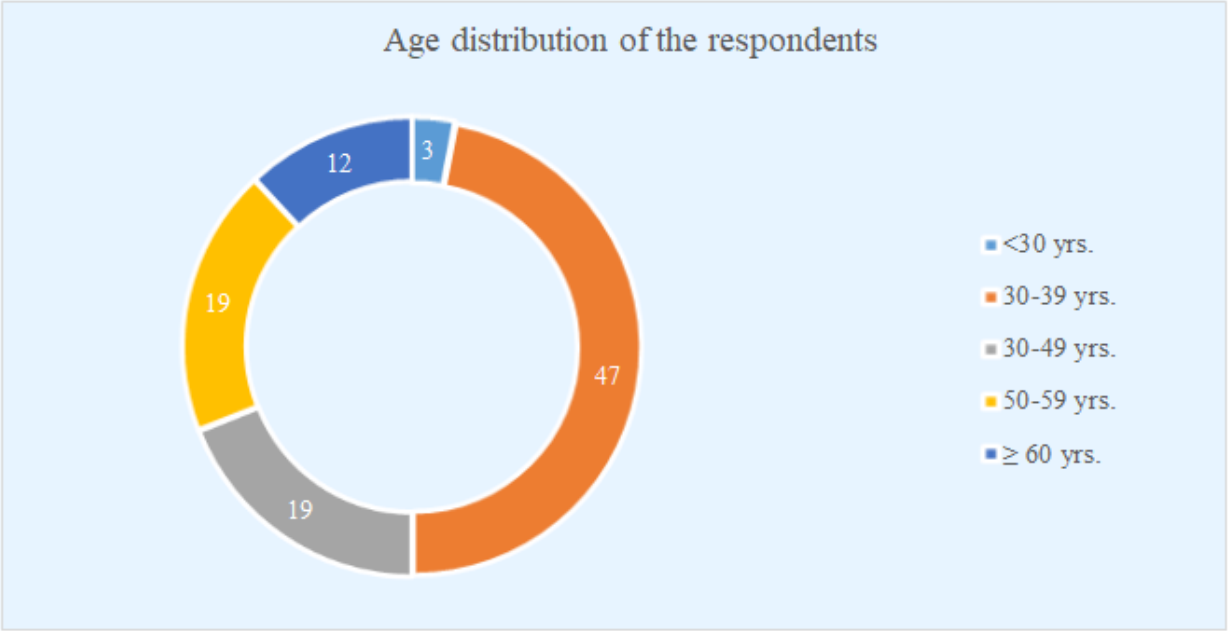

Figure I: Ring chart showed age wise respondents, (N=200)

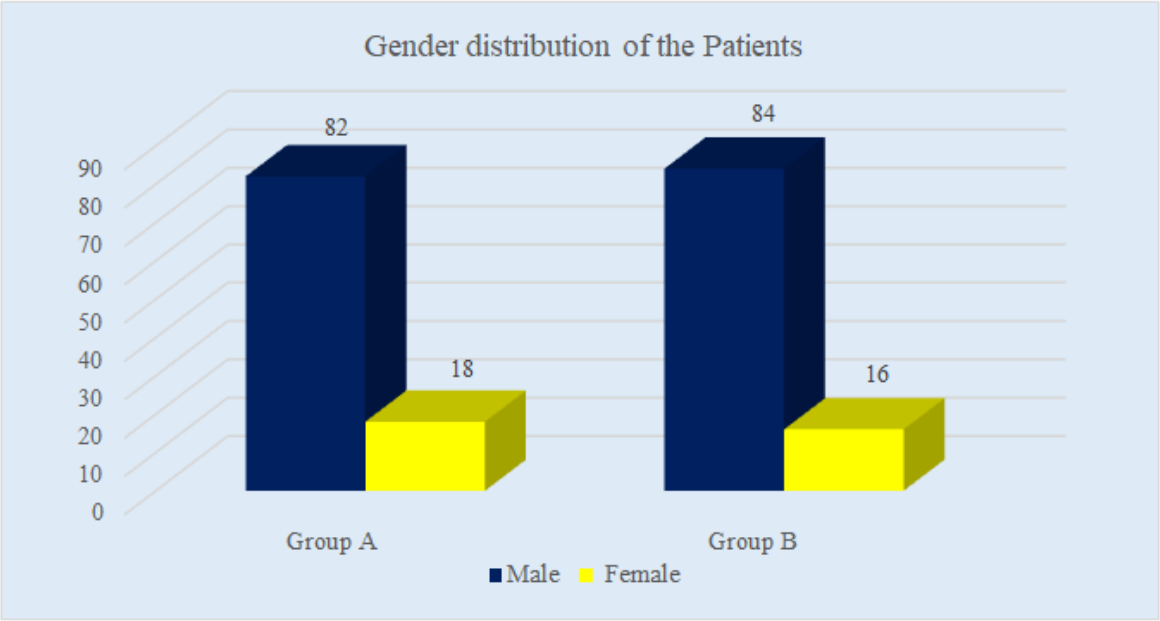

Figure II: Column chart showed gender wise respondent's, (N=200)

Table 2 showed it is found that majorities of the patients in both groups A & B (82 & 84 respectively) and female were 18 in group A & 16 in group B. The male to female ratio was 4.4:1.

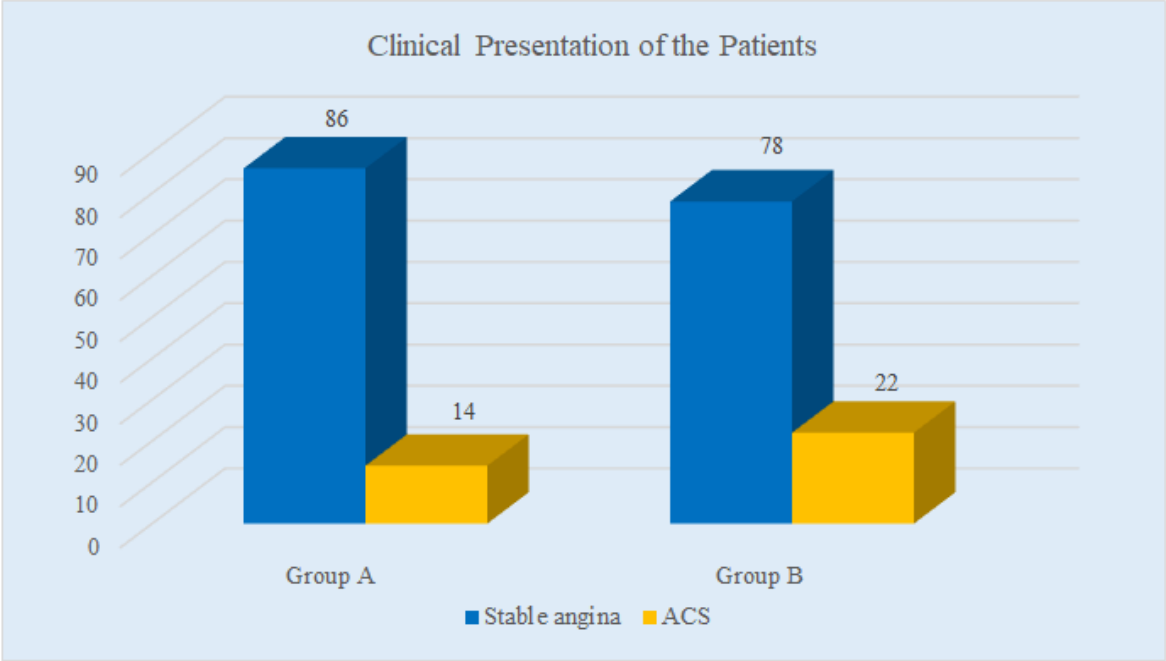

Figure III: Column chart showed Clinical Presentation wise respondent's, (N=200)

There were significant differences between two groups in respect to risk factors and angiographic findings. The prevalence of hypertension and diabetes were found to be more among group B CHD patients compare to group A patient ($p<0.001$) while, smoking and positive family history of IHD were more prevalent in younger age group ($p<0.05$). Normal or non-significant CAG findings were more common among group A compared to group B ($p<0.05$). Extent of Coronary stenosis: nearly 60% of group A & 80% in group B had significant stenosis: 38% of group A Exhibited normal CAG compared to 16% of group B patients.

Table 2: Distribution of patients by traditional risk factors in group A. (25-39 years)

Risk factors	Group	p-value
	Group A (n=100)	
Smoker(both present & past)	70(70.0%)	0.032
Overweight & obese	30(30.0%)	0.995
Hypertension	34(34.0%)	0.001
Diabetes	4(4.0%)	0.001
Impaired Fasting Glucose (IFG)	30(30.0%)	0.001
Family History of IHD	32(32.0%)	0.023

Table 3: Distribution of patients by traditional risk factors in group B. (40-70 years)

Risk factors	Group	p-value
	Group B (n=100)	
Smoker (both present & past)	44(44.0%)	0.032
Overweight & obese	30(30.0%)	0.995
Hypertension	48(48.0%)	0.001
Diabetes	30(30.0%)	0.001
Impaired Fasting Glucose (IFG) (FBS 100-125 mg/dl)	40(40.0%)	0.001
Family History of IHD	12(12.05)	0.023

Table 3 showed Traditional risk factors show that 70% of the patients in group A were smokers compared to 44% in group B ($p<0.005$). The proportion of overweight and obese subjects did not differ between groups (30% in each group) ($p=0.995$). Hypertension was significantly less in the group A (34%) than that in the group B (48%) ($p<0.001$). The presence of diabetes was staggeringly higher in the group B (30%) than that in the group A (4%) ($p<0.001$). The incidence of impaired fasting glucose was also much higher in the group B (40%) than that in the group A (30%) ($p<0.001$). A significantly higher incidence of family history of IHD was observed in the group A than in the group B ($p<0.05$).

DISCUSSION

This cross sectional observational study was carried out in the department of Cardiology, UCC, BSMMU, Dhaka, during the period of September 2013 to December 2013. The present study was carried out to assess the traditional risk factors and disease severity in between 25 to 70 years old CHD patients. Much research has been done regarding coronary artery disease and a number of risk factors have been established related to its causation. It is mainly a disease of elderly but studies have shown that the disease is just the tip of iceberg and its pathogenesis starts at early age [18]. Manifestation of disease in younger population aged <40 is even more interesting. CHD Manifesting in younger age group appears to be more common in the developing countries. Immigrants from developing countries particularly of Indian sub-origin are seen to be more susceptible to develop young CHD at younger age compared to the natives of the west [19]. It is a major cause of morbidity and mortality in the developed countries and its prevalence is rising in the developing countries. Though its prevalence is higher in developed countries, it has gained considerable attention in developing countries due to its rising trend and change in life style of the urban population. Old age is associated with a number of changes related to ageing in the coronary arteries [20]. These changes may contribute to genesis of lesion leading to coronary artery disease aided by classical risk factors. But in younger patients no such changes occur. Observation of occurrence of CHD at earlier age in person with profound disturbances in lipid metabolism like Familial hypercholesterolemia may indicate that some such overwhelming factors be present in young patients with CHD. Thus it follows that the risk factor involved in causation of CHD in younger and older populations would be expected to vary specially with regards to metabolic disturbances, life style and inherited susceptibilities. Prevalence of CHD varies in different parts of world. Over all its impact is more in the developed countries compared to the developing ones. But CHD in young people is found to be more frequent in developing countries especially those of Indian sub origin. Studies done in India showed that about 70% of patient from Calcutta & 97% patients from Madras were <60 years. Another report from Madras found that 10% of MI patient undergoing catheterization for angina pectoris was 27-40 years old with mean age of 38. On the contrary prevalence of CAD in young American population was <2%. Young CHD was also seen to be more frequent among Indian immigrants residing in America compared to the local natives [21]. Previous studies done over last two decades showed that the epidemiology of young patients with CHD differs in many aspects from those in old though they both share a common denominator. The risk factors and their relative frequency varied in between these two groups and so did the severity of disease and the prognosis [22]. Association of risk factors with causation of coronary artery disease in young population also appears to be stronger compared to elderly. This is true particularly with regards to certain specific risk factors like body mass index (BMI), Raised blood pressure (BP), low

density lipoprotein (LDL), triglyceride (TG), smoking and family history [23]. Studies showed CHD in young had stronger association with smoking, hyperlipidemia and a positive family history compared to diabetes and hypertension [24]. The extent of disease and severity was also less in younger patients with comparatively fewer number of coronary arteries affected [25]. A total of 200 patients with primary diagnosis of CHD who were admitted for coronary angiogram were included in this study. Patients aged less than 25 and more than 70 years, pts with renal impairment, pts unwilling to undergo CAG, previous CABG and PTCA done and those with outside Dhaka were excluded. Patients aged 25 to 40 years were grouped as group A and a 40 to 70 years were grouped as group B. Baseline clinical history, physical examination and investigations including reports of coronary angiogram were recorded accordingly. There were significant differences between two groups in respect to risk factors and angiographic findings. The prevalence of hypertension and diabetes were found to be more among group B CHD patients compare to group A patient ($p<0.001$) while, smoking and positive family history of IHD were more prevalent in younger age group ($p<0.05$). Normal or non-significant CAG findings were more common among group A compared to group B ($p<0.05$). Multiple vessel disease was observed to be more common amongst group B CHD patients ($p<0.01$). LAD and RCA involvement was more frequent in group B compared to group A patient ($p<0.01$). This indicated that risk factors and disease severity was different between two groups. In both the groups male predominance was observed but it was not different between two groups. Other risk factors like obesity and dyslipidemia were not found to be different. The result obtained in this study were consistent with those of other investigators with regards to certain risk factors like smoking, family history, hypertension and diabetes. But there were discrepancy regarding prevalence of dyslipidemia and occurrence of normal coronary arteries among group A patient with CHD. Normal coronary arteries being more frequent in our study subjects. No such study has been done in Bangladesh and those issues still remain "stones unturned". This entity appears to be more common in developing countries like ours, hits the most productive age group and possibly be preventable by identifying risk factors that have strong influence on its development. It seems worthwhile studying epidemiological risk factors in young CHD patients and comparing those with older patients with CHD in Bangladesh. Differences observed can be used for better understanding of risk factors among young CHD patients in our context and to prioritize therapeutic as well as community intervention. Even with best possible effort some limitations have been encountered in this study. Emerging risk factors we discussed earlier, are currently gaining much attention in pathogenesis in young CHD patients. This study could not assess these parameters.

CONCLUSION & RECOMMENDATIONS

The present study was carried out to assess the traditional risk factors & disease severity in between 25-39 & 40-70 years' age group of CHD patients. There was significant difference between two groups in respect to risk factor & CAG findings. The prevalence of Hypertension & DM were found to be more among group B CHD patients compared to Group A patients while smoking & positive family history of IHD were more prevalent in younger age group. Although CHD is an uncommon entity in young adults aged <40 years it constitutes an important problem for both the patient and the treating physician. It has devastating effect on the more active life style of young patients. This group of patients also have a different risk factor profile, clinical presentation & CAG finding in comparison with group B patients. The increased prevalence of risk factors for CHD may set up an alarming trend.

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