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Cardiology

Effect of Risk Factor in Coronary Heart Disease (CHD)

Dr. Md. Habibur Rahman[1*], Prof. (Dr.) Md. Faruque[2], Dr. Khondker Shaheed Hussain[3], Dr. Md. Sirajum Munir[4]

[1]Assistant Professor, MD, Cardiology, US Bangla Medical College, Dhaka, Bangladesh
[2]Professor, MD, Cardiology, Anwar Khan Modern Medical College, Dhaka, Bangladesh
[3]Associate Professor, MD, Cardiology, National Institute of Cardiovascular Diseases, Dhaka, Bangladesh
[4]Assistant Professor, MD, Cardiology, Kushtia Medical College, Kushtia, Bangladesh

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***Corresponding author:** Dr. Md. Habibur Rahman

Abstract **Original Research Article**

Objectives: In this study our main aim to evaluate the effect of risk factor in Coronary heart disease (CHD). ***Methods:*** This cross-sectional observational study was done in NICVD, Dhaka from October 2010 to September 2011.A total of 100 consecutive patients were included. Study populations were sub-divided into two groups on the basis of cTn I level. In group I cTn I level ≥20ng/ml and in group II cTn I level <20ng/ml. 50 patients were included in group I and 50 patients were included in group II. ***Results:*** In group-1 most of the patients belong to 40-50 years age group where as in group-2 majority belong to >50 years age group. Prevalence of smoking habit was higher in Group I than that in Group II (78% vs. 56%) with statistically significant difference (p=0.02). Hypertension was almost identically distributed between two groups (62% vs. 58%, p=0.68). Diabetes and dyslipidaemia were also higher in group I than that of group II (60% vs. 36%) and (66% vs. 34%) respectively with statistically significant difference (p=0.02 and p=0.001). ***Conclusion:*** From our study we can conclude thatsmoking, diabetes mellitus, dyslipidaemia, and cTn I were emerged as independent predictors of CAD. Further study is needed for better outcome.

Keywords: *Coronary heart disease (CHD), diabetes mellitus, dyslipidaemia,cTn I.*

INTRODUCTION

Coronary heart disease (CHD) is a major cause of death and is a global health problem reaching epidemic in both developed as well as in developing countries. The acute coronary syndrome is a frequent presentation of cardiovascular disease. Acute coronary syndrome (ACS) refers to a spectrum of acute severe cardiac disorders which include unstable angina (UA), Non-ST-segment elevation myocardial infarction (NSTEMI), and ST-segment elevation myocardial infarction (STEMI) It has emerged as a major health burden in developing countries and is a subject of great concern for its significant contribution to mortality. It is a major cause of cardiovascular morbidity and mortality for which timely diagnosis and appropriate therapy is of paramount importance to improve clinical outcome [1-3].

High rates of coronary heart disease in people of South Asian (Indian, Pakistani, and Bangladeshi) origin were first reported from Singapore, South Africa, and Trinidad in 1950s, similar findings were recorded in the United Kingdom at the time of the 1971 census. The clinical picture in South Asian patients with coronary heart disease is similar to that in Europeans. Smoking in South Asian patients is generally less common, average plasma cholesterol concentrations are lower and diabetes is more common than in European patients.

The prevalence of CAD in Bangladesh was estimated as 3.3 per thousand in 1976 and 17.2 per thousand in 1986 indicating fivefold of the disease by 10 years. Three small scale population-based studies showed average prevalence of ischemic heart disease 6.5 per thousand population of Bangladesh [4]. In this study our main goal is to evaluate the effect of risk factor in Coronary heart disease (CHD).

OBJECTIVE

General objective

To evaluate the effect of risk factor in Coronary heart disease (CHD).

Specific objective

To identify systolic Diastolic BP of patients

To detect association of predictors of significant coronary artery disease with risk factors

METHODOLOGY

Study type

- It was a cross sectional study.

Place and period of the study

- This study was carried out in NICVD, Dhaka from October 2010 to September 2011.

Inclusion criteria

- Ischemic symptoms

Study population

All patients diagnosed as acute STEMI admitted in NICVD and undergoing coronary angiography during hospital admission were taken as study population.A total of 100 consecutive patients were included. Study populations were sub-divided into two groups on the basis of cTn I level. In group I cTn I level ≥20ng/ml and in group II cTn I level <20ng/ml. 50 patients were included in group I and 50 patients were included in group II.

Method

All patients admitted in Cardiology department of NICVD, Dhaka, fulfilling the inclusion criteria and exclusion criteria was considered for study.Informed written consent was taken from all patients or from legal guardian before enrollment.Acute STEMI was diagnosed by ESC/ACC guideline 2004.Initial evaluation of the patients by history and clinical examination was performed and recorded in patients' data collection sheet.Demographic profile, and pulse, blood pressure, body weight were recorded. Serum cTn I level was estimated and recorded by Immulite 1000 Troponin I. (SIEMENS Medical Solutions Diagnostic, Los Angeles, CS, USA). Echocardiographic ejection fraction was recorded on second or third day of hospitalization.Coronary angiogram was done during hospital admission.Angiographic severity of coronary artery disease was assessed by Vessel score and Stenosis score.

STATISTICAL ANALYSIS

The numerical data obtained from the study was analyzed and significance of differences was estimated by using statistical methods. Computer based SPSS (Statistical Package for Social Science) was used. Data is expressed in percentage, frequencies, means and standard deviation as applicable by simple linear analysis, Pearson x^2 square test, Students' t test, Pearson's correlation coefficient test, multivariate logistic regression analysis and Fisher's exact test as applicable. P value of less than 0.05 was considered as significant.

RESULTS

In figure-1 shows age distribution of the patients where in group-1 most of the patients belong to 40-50 years age group where as in group-2 majority belong to >50 years age group. The following figure is given below in detail:

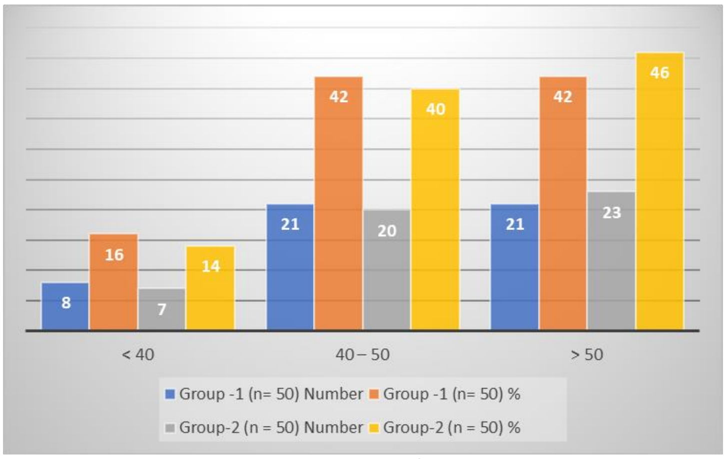

Fig-1: Age distribution of the patients.

In table-1 shows gender distribution of the patients were among the study population the male and female patients were identical in both the groups which was statistically insignificant (p=0.74) by χ^2 (Chi square) test. The following table is given below in detail:

Table-1: Gender distribution of the patients

Gender	Group-1, n	Group-1, %	Group-2, n	Group-2, %	P value
Male	45	90.0	44	88.0	0.74^{ns}
Female	5	10.0	6	12.0	

In figure-2 shows distribution of cardiovascular risk factors.Prevalence of smoking habit was higher in Group I than that in Group II (78% vs. 56%) with statistically significant difference (p=0.02). Hypertension was almost identically distributed between two groups (62% vs. 58%, p=0.68). Diabetes and dyslipidaemia were also higher in group I than that of group II (60% vs. 36%) and (66% vs. 34%) respectively with statistically significant difference (p=0.02 and p=0.001). Finally, family history of IHD was higher in group I than that of group II (28% vs. 20%) with statistically insignificant difference (p=0.34). All the analysis of the above table were performed by χ^2 (Chi square) test. The following figure is given below in detail:

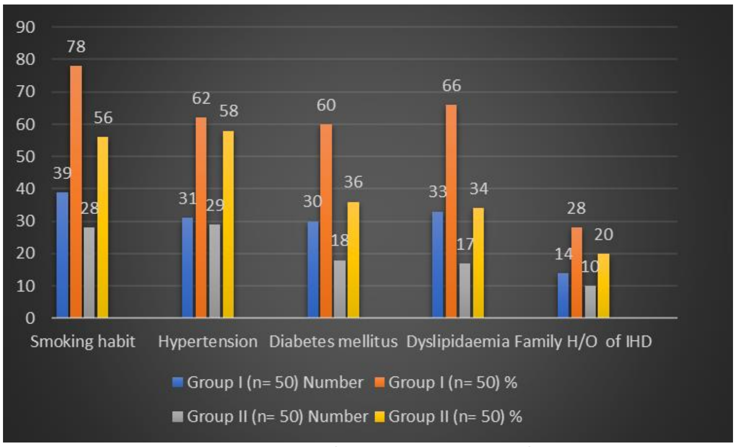

Fig-2: Distribution of cardiovascular risk factors.

In table-2 showsdistribuation of the patients according to systolic Diastolic BP where the mean systolic blood pressure was 117.8±19.1 mmHg in group I and 115.9±27.7 mmHg in group II. The mean diastolic blood pressure was 79.9±11.4 mmHg in group I and 77.9±13.3 mmHg in group II. There was no statistically significant difference (p=0.69 and p=0.68) in systolic and diastolic blood pressure by Student's t-test. The following table is given below in detail:

Table-2: Distribuation of the patients according to systolic Diastolic BP

Variable	Group -1 (n = 50)	Group-2 (n = 50)	p-value
Systolic BP (mm Hg)	117.8±19.1	115.9±27.7	0.69^{ns}
Diastolic BP (9mm Hg)	79.9±11.4	77.9±13.3	0.68^{ns}

In table-3 shows association of predictors of significant coronary artery disease with risk factors where the regression model which included 4 predictor variables observed to be associated with significant coronary artery disease were directly entered into the binary logistic regression model. Hosmer and Lemeshow goodness-of-fit test demonstrated that the model was a good fit model which could predict 88.% of significant coronary artery disease by the coronary artery disease severity, stenosis >70% in any coronary artery, for left main >50% stenosis, correctly (p=0.303). The following table is given below:

Table-3: Association of predictors of significant coronary artery disease with risk factors (n=100)

Variables of interest	Univariate analysis		Multivariate analysis	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Smoking	3.78 (1.79-8.96)	0.01^{s}	2.79 (1.13-6.36)	0.02^{s}
Diabetes Mellitus	2.59 (1.46-6.20)	0.02^{s}	2.24 (1.11-5.54)	0.04^{s}
Dyslipidaemia	1.84 (1.34-2.84)	0.01^{s}	1.66 (1.51-2.28)	0.01^{s}
cTn-I level (>20 ng/ml)	1.59 (1.01-1.89)	0.001^{s}	1.49 (1.02-1.79)	0.001^{s}

s=Significant
ns=Not significant

DISCUSSION

Smoking was the most common risk factor observed among the current study population and was found 78% patients in group I (cTn I evel≥20ng/ml) and 56% patients in group II (cTn I evel<20ng/ml) with statistically significant difference (p=0.02) between the two groups. One study found in their study population 81.8% smoker. [5]. Another report observed in their study 73.3% smoker [6], One article reported that, 20% smoker with group I, 27% smoker with low group II and another study observed in their study population (46% vs. 47%) smoker in group I and in group II respectively, the cause of this discordance with the current study might be due to geographical difference[7, 8].

Regarding other risk factors in this current study it was observed that hypertension was almost identically distributed (62% vs. 58%), without any statistical difference between the two groups (p=0.68). One study reported that (77% vs. 72%) in group I and in group II[5]. One study found that, 66% and 65% hypertensive patients in group I and in group II respectively, another study observed in their study population 58.9% was hypertensive[8].

DM was higher in group I than that of group II (60% vs. 36%) with statistically significant difference (p=0.02) between the two groups. One study observed in their study population 47.1% with DM, which was similar with the current study [7]. The cause of this discordance between those studies with the current study might be due to difference of racial, geographical and dietary habit.

Regarding dyslipidaemia, it was higher in group I than that of group II (66% vs.34%) with statistically significant difference (p=0.001) between the two groups. One report observed in their study population 53.33% dyslipidaemic[9] and another report observed in their study population 72.06% dyslipidaemic which were also similar with the current study[10]. One study observed in their study family history of IHD (25% vs. 25%)[11] and another study found in their study family history of IHD (32% vs. 32%) in group I and in group II respectively, with no significant difference between the two groups, which were also consistent with the present study[9].

There were no statistically significant difference in systolic and diastolic blood pressure (p=0.69 and p=0.68) between the two groups. One study observed in their study mean heart rate was 86 beats/min in group I and 79 beats/min in group II, the mean systolic blood pressure was 146 mmHg in group I and 148 mmHg in group II which had similarities with the present study [12].

Multivariate logistic regression analysis and odds ratio (95%CI) of explanatory variables were done for 100 STEMI patients considering CAD (Significant coronary artery disease - coronary stenosis >70%, for left main >50% stenosis) as dependent variable.

Conclusion

From our study we can conclude that smoking, diabetes mellitus, dyslipidaemia, and cTn I were emerged as independent predictors of CAD. Further study is needed for better outcome.

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