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### **Risk Factors among the Coronary Heart Disease (CHD) Patients Attending at Tertiary Level Hospitals of Dhaka City, Bangladesh**

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#### **Abstract**

**Background:** Cardiovascular diseases, mainly coronary heart disease is one of the leading causes of death in Bangladesh and increasing in epidemic proportion in time.

**Objective:** To identify and quantify risk factors among the coronary heart disease patients attending at tertiary level hospitals.

**Methods:** A cross-sectional study was carried out among 144 diagnosed CHD patients who were admitted in different tertiary level hospitals in Dhaka city during March to June 2010. The respondents were selected through purposive sampling for interview and data were collected by face to face interview. Patients record file were also reviewed using checklists. Data were analyzed by SPSS version 16.0 and presented in tables and graphs.

**Results:** The mean age of the respondents were  $55.26 \pm 12.35$  years. More than two-third (69%) of the respondents were exposed to smoking. Majority (85%) were physically inactive. The recommended intake of fruits and vegetables by the respondents were low (30%). About 60% of the respondents were found to intake extra table salt. The percentage of overweight

and obesity was high (67%) with higher proportion of women (82.1%) than men (62.9%). About two-third of the respondents (65%) were with higher level of cholesterol. The prevalence of diabetes mellitus and hypertension were 36% and 51 % respectively. Risk factors analysis revealed at least one risk factor was among almost all of the respondents (99.3%) and at least two, three and four risk factors was prevalent among 98.6%, 87.5% and 66.7% of the respondent respectively.

**Conclusion:** A substantial proportion of different behavioral, biological and biochemical risk factors were present among coronary heart disease patient that suggests the need for ongoing monitoring of CHD risk factors and implementation of effective preventive strategies for reducing secondary events and its consequences.

**Key words:** *Coronary Heart Disease, Risk Factors*

### **Introduction**

Chronic disease burden is a rapidly increasing worldwide phenomenon. Chronic non-communicable disease is the challenge for 21 century. Globally, non-communicable diseases (NCDs) are increasingly recognized as a major cause of morbidity and mortality. A total of 57 million deaths occurred in the world during 2008; 36 million (63%) were due to NCDs, principally cardiovascular diseases, diabetes, cancer and chronic respiratory diseases. Nearly 80% of these NCD deaths (29 million) occurred in low- and middle-income countries <sup>1</sup>. The leading cause of NCD deaths in 2008 was cardiovascular diseases (17 million deaths, or 48% of NCD deaths) and it was responsible for the largest proportion of NCD deaths under the age of 70 (39%) most of which were contributed from low and middle income countries like Bangladesh <sup>1 2 3</sup>. Bangladesh also shows the upward trend of non-communicable disease mortality and morbidity. In recent years, Bangladesh is passing through an epidemiological transition from communicable diseases to non-communicable diseases and currently has a double burden of diseases. Very recent data showed that non-communicable diseases accounted 52% of deaths in Bangladesh in the year of 2010, more than half of which (27%) was contributed form cardiovascular diseases (mainly coronary heart disease and myocardial infarction) <sup>4</sup>. the number of people with Coronary heart disease is increasing day by day due to epidemiological transition and several risk factors that could be modifiable and non-modifiable. But the disease can be prevented simply by modifying the risky behavior that makes the people getting the disease.

7.2 million death due to Coronary Heart Disease (CHD) in the world every year, many of which are preventable by action on the major primary risk factors: unhealthy diet, physical inactivity, and smoking.<sup>5</sup>

Coronary heart disease is the leading cause of cardiovascular mortality worldwide, with >4.5

million deaths occurring in the developing world. Despite a recent decline in developed countries, both CAD mortality and the prevalence of CHD risk factors continue to rise rapidly in developing countries.<sup>7</sup> This Disease (CHD) has been increasing exorbitantly in developing countries since last 30years. As per study of WHO, India & Bangladesh will be the capital of Coronary heart disease by 2016 if these diseases can't be prevented and controlled.<sup>6</sup>

Data from the 2006 Health Survey for England suggest the prevalence of CHD in England was 6.5% in men and 4.0% in women.<sup>7</sup> Coronary heart disease (CHD) is preventable yet kills more than 70,000 people and 110,000 people have a heart attack in England every year.

Extensive clinical and statistical studies have identified several factors that increase the risk of Coronary heart disease and heart attack. Major risk factors are those that significantly increase the risk of coronary heart diseases.<sup>8</sup>

Coronary heart disease is such type of diseases which can be prevented by reducing the risk factors such as socio-demographic factors, behavioral factors, biochemical factors and co-morbid conditions. They increase the chance that Coronary Heart Disease, if already present, will worsen, while some cannot be modified, most can.<sup>9</sup> Having just one risk factor doubles risk of CHD. Having two risk factors increases risk of CHD fourfold. Having three or more risk factors increases risk of CHD more than tenfold. Also, some risk factors, such as smoking and diabetes, put at greater risk of CHD and heart attack than others<sup>1</sup>. The current study was aimed to see the distribution of different risk factors among the patients with CHD attending at tertiary level hospital.

### **Methods**

A Cross-sectional study was conducted among 144 diagnosed CHD patients who were admitted in different tertiary level hospitals in Dhaka city. Both primary and secondary data was collected from patients with Coronary Heart Diseases (CHD) through face to face interview and by check list from the document who were admitted in National Institute of Cardiovascular Diseases (NICVD) and Ibrahim Cardiac Hospital and Research Institute (ICHRI) from March 2010 to June 2010. The inclusion criteria were diagnosed Coronary heart disease (CHD) admitted at tertiary level hospitals. Respondents were requested for verbal consent before participating in interview for data collection. Data was collected through face to face interviews by the structured questionnaire and checklist where included

different risk factor like- socio-demographic factors, behavioral risk factors, biochemical factors and co-morbid factors. Data were analysed by SPSS version 16.0.

### **Results**

Of total respondents, 80.6% (116) were male. The mean age of the respondents was  $55.3 \pm 12.3$  years and about two-third of them (64%) were  $\geq 50$  years. Literate people (88.2%) and income level  $< 10,000$  taka (57%) were more prone to experienced of CHD respectively. About two thirds (70%), (69%) and (69%) were found to be low intake (Less than five Servings) of fruits and vegetables, smoker and overweight or obese respectively. More than two thirds (85%) were physically inactive. Hypertension is an individual risk factor for CHD which was 51.0% as shown in table 1.

The majority of the respondents 99.3%, 98.6%, 87.5% and 66.7% had at least one, two, three and four CHD risk factors respectively as shown in figure 1

BMI (Over weight & Obesity) was significantly associated with hypertension ( $P=0.001$ ) and elevated cholesterol ( $P=0.001$ ). The physical inactivity and low intake of vegetables and fruits were high in proportion among the respondents with high BMI, however, no significant association were found ( $p>0.05$ ) as shown in table 2.

### **Discussion**

Many of the modifiable risk factors for CHD are behavioral in nature. These are mainly an unhealthy diet, physical inactivity and tobacco use. These behavioral factors may show up in individuals as raised blood pressure, raised blood glucose, raised blood cholesterol and obesity. These major risk factors have been responsible for 80% of coronary heart disease<sup>3</sup>. Having just one risk factor doubles risk of CHD, Having two risk factors increases risk of CHD fourfold. Having three or more risk factors increases risk of CHD more than tenfold. Also, some risk factors, such as smoking and diabetes, put at greater risk of CHD and heart attack than others.<sup>1</sup>

In this study 69% of participants have the history of smoking most of them were male among them the duration of smoking ( $>10$  years) having more than 50%. With regards to smoking, similar findings were observed in the Thailand study where majority were also males the risk of smoking in men was significantly more than in women and this was in sharp contrast to the British family heart study where there was hardly any difference between male and

female current smokers<sup>10</sup>. That means it is one of the major risk factors for the study population. It is almost same in USA. About 86,800 people die due to coronary heart disease attributable each year to cigarette smoking in USA.<sup>11</sup>

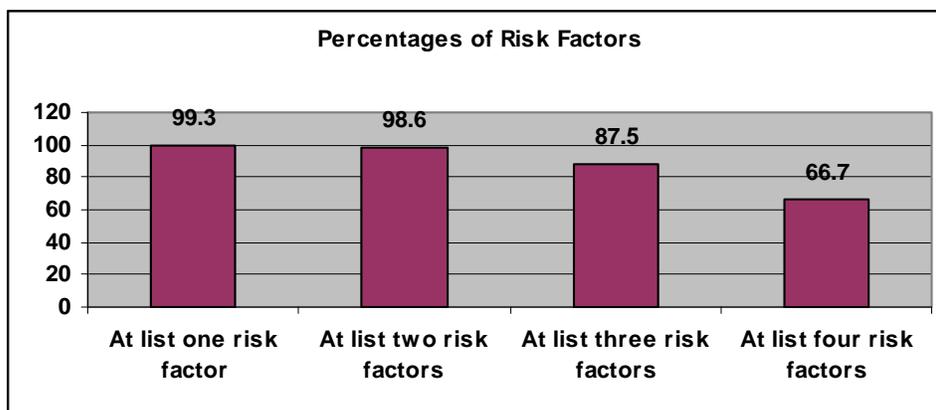
**Table 1: Frequency Distribution of the Study Sample by Socio-Demography and Modifiable CHD Risk Factors**

<b>Socio-demographic Status</b>		<b>Percentages n (%)</b>
<b>Age</b>		
Mean ± SD years	55.26 ±12.35	
≤ 50 Years		52 (36.1%)
>50years		92 (63.9%)
<b>Gender</b>		
	Male	116 (80.6%)
	Female	28 (19.4%)
<b>Educational Level</b>		
Primary and below		39 (27%)
SSC Completed		55 (38.2%)
HSC and above		50 (34.7%)
<b>Monthly Household Income</b>		
≤ 10,000/= per month		82 (56.9%)
10,001-20,000/=		35 (24.3%)
20,001-30,000/=		21 (14.6%)
>30,000/=		06 (4.2%)
<b>Occupational Categories</b>		
Business		41 (28.5%)
Service holder		39 (27.1%)
House wife		22 (15.3%)
Labour (Agriculture & Non-agri)		30 (20.8%)
Unemployed		12 (8.3%)

<b>Behavioral Risk Factors</b>	<b>Male (N=116) n (%)</b>	<b>Female (N=28) n (%)</b>	<b>Both sexes (N=144) n (%)</b>	<b>95% CI (For both sexes)</b>
Tobacco use (Smoker)	95 (81.9)	4 (14.3)	99 (69)	(61.5-76.5)
Physical activity (Inactive)*	97 (83.6)	26(92.9)	123 (85)	(79.2-90.8)
Inadequate fruits and vegetables intake* *	83 (71.6)	18(64.3)	101 (70)	(62.5-77.5)
Taking extra salt	66 (56.9)	21(75.0)	87 (60)	(52.0-68.0)
Emotional Stress	79 (68.1)	21 (75)	100 (69)	(61.4-76.5)
<b>Co-morbid &amp; Bio-chemical risk factors</b>				
Diabetes mellitus	36 (31)	16(57.1)	52 (36)	(28.2-43.8)
High blood pressure (HTN)	52 (44.8)	21 (75)	73 (51)	(42.8-59.2)
Mean ± SD Body Mass Index (BMI)	24.46 ± 3.49			
Over weight and obese(≥23.0 kg/m <sup>2</sup> )	73 (62.9)	23(82.1)	96 (67)	(59.3-74.7)
High Cholesterol level (> 5.2 mmol/L)	49 (42.2)	16(57.1)	65 (45)	(36.9-53.1)
<b>Family History</b>				
Family history of chronic diseases	23 (16%)			

\*Respondents who did not maintain at least 30 minutes of walking per day for at least 5 days/week

\*\*Respondents who did not take at least 5 servings (1 servings is equivalent to 80 gms) of fruits and vegetables/day



**Figure 1: Distribution of risk factors among the respondents.** These seven risk factors (High blood pressure, diabetes mellitus (DM), overweight & obese, high cholesterol, physical inactivity, low intake of vegetables and fruits and smoking status) were included in this analysis

According to participants’ information, majority of the respondents (85%) were physically inactive So, it is a matter of concern to make people interested for being physically active. Nearly 60 million Americans have a form of heart or blood vessel disease due to sedentary lifestyle.<sup>12</sup>

**Table-2: Association of BMI with status of Blood pressure, cholesterol level, physical activity and vegetables and fruits intake.**

Variables	Status of BMI		$\chi^2$ Value	P- Value	
	$\geq 23.0 \text{ kg/m}^2$	$< 23.0 \text{ kg/m}^2$			
Status of BP	High	61 (63.5%)	12 (25.0%)	19.018	0.001
	Normal	35 (36.5%)	36 (75.0%)		
Status of Physical activity	Inactive	86 (89.6%)	37 (77.1%)	4.014	0.077
	Active	10 (10.4%)	11 (22.9%)		
Status of intake of vegetables & fruits	<5 servings	71 (74.0%)	30 (62.5%)	2.006	0.179
	$\geq 5$ Servings	25 (26.0%)	18 (37.5%)		
Status of Cholesterol level	High	55 (57.3%)	10 (20.8%)	17.176	0.001
	Normal	41 (42.7%)	38 (79.2%)		

Having diabetes puts people with the condition at a much higher risk of CHD. In this study about 36 % have the history of Diabetes Mellitus. If we want to see the distributions of the respondents according to duration of Diabetes Mellitus, 46.2% of the respondents have DM for < 5 years, 34.6% have for 5-10 years, 11.6% have for 11-15 years and 7.6% have for >15 years.. People with diabetes have a two to five fold risk of developing heart disease and have the same risk of developing heart disease as a person who has had a heart attack but who doesn't have diabetes.<sup>13</sup>

An increasing prevalence of hypertension with increasing age appears to be a universal phenomenon and may be attributable to the aging process. Reduction in blood pressure is central to the management of cardiovascular risk and provides a starting point for initiating a more comprehensive cardiovascular risk management strategy<sup>14</sup>.

With regards of blood pressure 50.694% have the history of high blood pressure among them about more than half of the respondents have for  $\geq 5$  years. If we want to know the situation of another study population of the world, according to a study on a state of Brazil, prevalence of one of the risk factors for Coronary heart disease, high blood pressure is 31.6% (considering >140/90mmHg) and 14.4% (considering >160/95mmH) which is a significant result.<sup>15</sup>

The mean values for BMI and total cholesterol in our study were similar to those in the Thailand study, where BMI was 24 kg/m<sup>2</sup> and total cholesterol was 5.2 mmol/L but in this study BMI was 23 kg/m<sup>2</sup>, cholesterol was same. In both studies, women had higher levels of

BMI and cholesterol level .<sup>16</sup>

In our study the risk factor of having between 1 to 4 risk factors was slightly higher at 99.3%, 98.6%, 87.5% and 66.7% respectively. Similar findings were also observed among the Southwestern Native American tribes<sup>17</sup>.

Coronary heart disease among the first degree relatives is 16% and 84% of respondents have no history of Coronary heart disease among the first degree relatives while it is a known risk factor for Coronary heart disease events.<sup>18</sup> This low rate of having family history is unknown. But it may be due to under reporting, because maximum patient are aged and from low socioeconomic status; so, they are may be not so aware about the disease. That's why, there is a chance that the patients actually don't know that he or she has family history of Coronary heart disease or not.

### **Conclusion**

A substantial proportion of different behavioral, biological and biochemical risk factors were present among coronary heart disease patient that suggests the need for ongoing monitoring of CHD risk factors and implementation of effective preventive strategies for reducing secondary events and its consequences. The findings also clearly show a vital need for health promotion interventions those targets CHD and their risk factors. Awareness of these risk factors must be at the forefront of thinking in physicians or other related health care professionals who are in primary contact with patients in different health care centers for the prevention of CVD.

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