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Obesity and its Relation to Coronary Artery Disease (CAD) Incidence

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Abstract- *Background:* Cardiovascular disease (CAD) has become a global health issue. If you have acute coronary syndrome, you run the risk of dying or being disabled while still in your prime.

Objective: The primary goal of this study is to assess the obesity effect and its relation to coronary artery disease (CAD).

Method: These data were collected in a cross-sectional research done at a private hospital in the period of January 2019 to January 2020, and all data was recorded systematically in a pre-formed data sheet and analysed using applicable statistical techniques.

Result: In the study male patients were 30% higher than female. Dyslipidaemia and obesity were very much common in 74%, 79% patients. Out of 150 patients 54% male and 46% female belongs to obese group.

Conclusion: Individuals with obesity are more likely to develop heart disease in Bangladesh, based on the data we have. According to recent research, the incidence of obesity in cardiovascular illnesses may be higher than previously thought.

Keywords: *coronary artery disease (CAD), obesity, high blood pressure.*

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Obesity and its Relation to Coronary Artery Disease (CAD) Incidence

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I. Introduction

Cardiovascular disease (CAD) is caused by cholesterol plaque development in the heart's arteries, which is increased by obesity. There are numerous other risk factors for coronary heart disease (CAD) that are associated with obesity. Cardiovascular disease is more common in those who are obese in the abdominal area (central obesity or "visceral obesity"). [1-3]

It has been estimated that between 12 and 16 percent of Indians are affected with coronary artery disease (CAD). Five-fifths (52 percent) of all CVD-related fatalities occur among persons under the age of 50, and about a quarter of all acute myocardial infarctions (MI) occur in those under the age of 40 in India as well 4 Patients who seek medical attention owing to symptomatic sickness may represent the "tip of the iceberg" when combining visible and subclinical disease. Due to the fact that asymptomatic individuals seldom seek medical attention, the real prevalence of CAD has been grossly underestimated since childhood.[4]

Heart failure is a risk factor even in those without coronary artery disease. The exact process by which obesity causes heart failure without coronary artery disease is uncertain, although two major ideas exist.[5]

Firstly, fat people have more blood in their bodies, which makes the heart work harder and can lead to heart failure in the long run. ventricular hypertrophy is a condition in which the heart's muscle size increases as it works harder. Obesity has also been related to sleep apnea, which can lead to respiratory problems and high blood pressure in the long term. [6]

The major objective of this study is to examine the obesity impact and its link to coronary artery disease (CAD).

II. Objective

a) General objective

- To evaluate the obesity effect and its relationship to CAD.

b) Specific objective

- To detect risk factor of CAD.
- To estimate incidence of systolic and diastolic hypertension of all study patients.

III. Methodology

a) Study type

➢ This was a cross sectional study.

b) Study place and period

➢ This study was conducted from January 2019 to January 2020 at different private hospital.

c) Method

150 rural and urban individuals with 21 to 70 years of age and both genders were randomly chosen for a cross-sectional research. Participants under the age of 20, pregnant women and those taking medication were excluded from the study. The study's goals were explained to the eligible participants. Participants were asked to visit a local health care facility after obtaining informed permission. Participant's physical activity, family history of hypertension or

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diabetes and smoking were all gathered using a WHO-STEPS modified methodology.

d) Statistical Analysis

- A pre-formatted data sheet was used to capture all data, and the data was then analyzed using applicable statistical techniques using Microsoft Windows software version 20. Simple percentages were used to assess the prevalence of hypertension. t-tests and chi-square tests were used to determine the significance of the results. At a threshold of 95 percent (p =0.05), all statistical tests were judged significant.

IV. Result

In table-1 shows age distribution of the patients where for both male and female, most of the patients belongs to (41-50) age group, 57%. The following figure is given below in detail:

Table-1: Age distribution of the patients

Age group	%
21-30	6%
31-40	8%
41-50	57%
51-60	20
61-70	9%

In figure-2 shows gender distribution of the patients. Where among 150 patents male patients were 30% higher than female. The following figure is given below in detail:

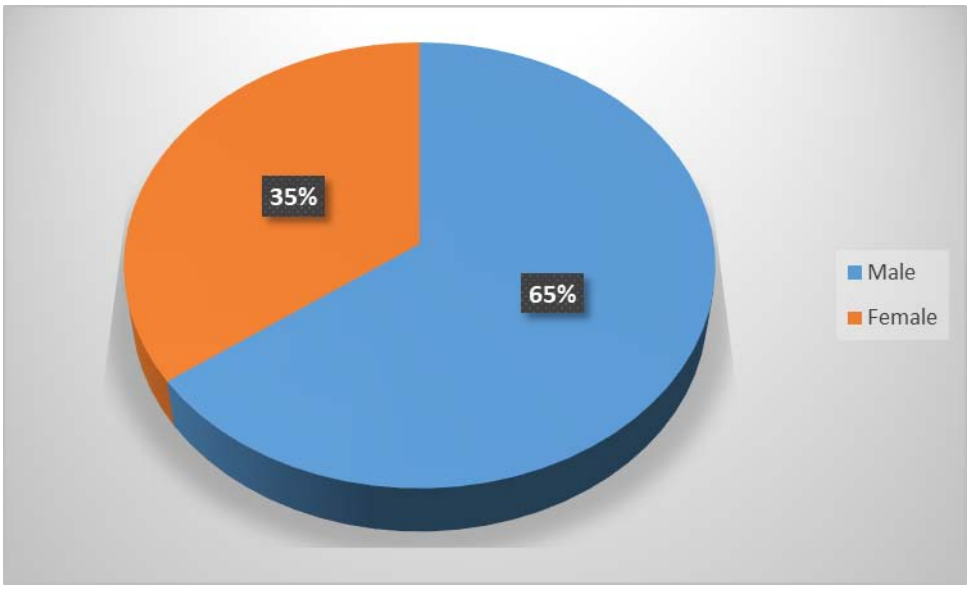

Figure-2: Gender distribution of the patients

In figure-3 shows the percentage of obesity in the patients where, out of 150 patients 54% male and 46% female belongs to obese group. The following figure is given below in detail:

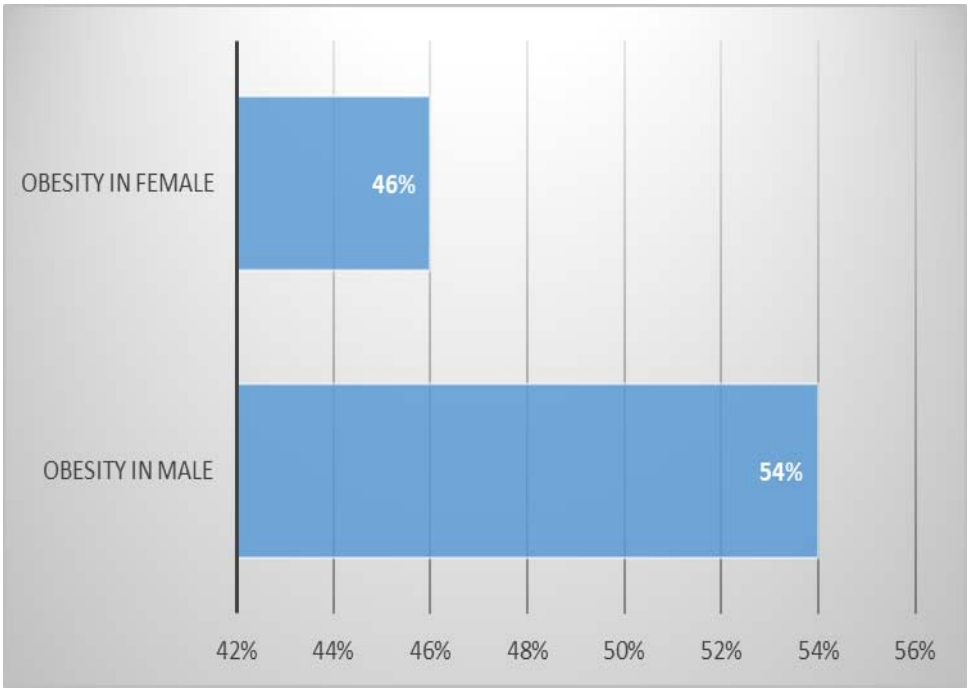

Figure-3: The percentage of obesity in the patients

In table-2 shows the incidence of systolic and diastolic hypertension of all study patients, where among total 150 patients, systolic hypertension was 24% whereas diastolic hypertension 28%. The following table is given below in detail:

Table-2: The incidence of systolic and diastolic hypertension of all study patients

Group	%
Systolic hypertension	24%
Non systolic hypertension	76%
Total	100%
Diastolic hypertension	28%.
Non diastolic hypertension	72%
Total	100%

In figure-4 shows distribution of patients according their living place where 52% people lived in rural area where as 48% people in urban area. The following figure is given below in detail:

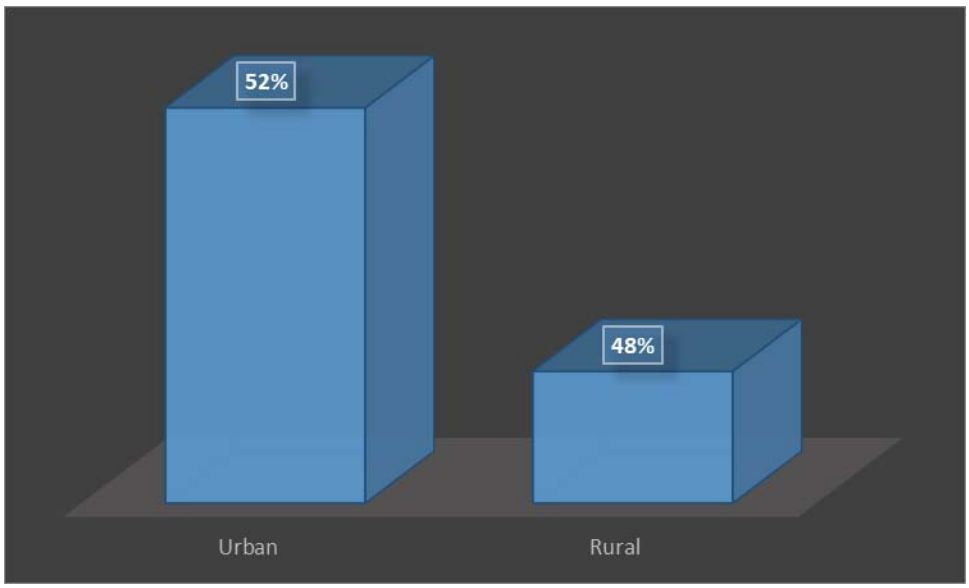

Figure-4: Distribution of patients according their living area

Table-2 shows risk factor analysis of the patients where dyslipidaemia and obesity were very much common in 74%, 79% patients. The following table is given below in details:

Table-2: Distribution of risk factors for CHD in patients (n = 150)

Risk Factors	(n = 150)
	%
Smoking	52%
Hypertension	63.5%
Dyslipidaemia	74%
Obesity	79%
DM	30%
Family history	26%
Sedentary life style	19%

In figure-5 shows angiographic pattern of study population where majority cases belong to single vessel coronary artery disease (SVCAD) group, 50%. The following figure is given below in detail:

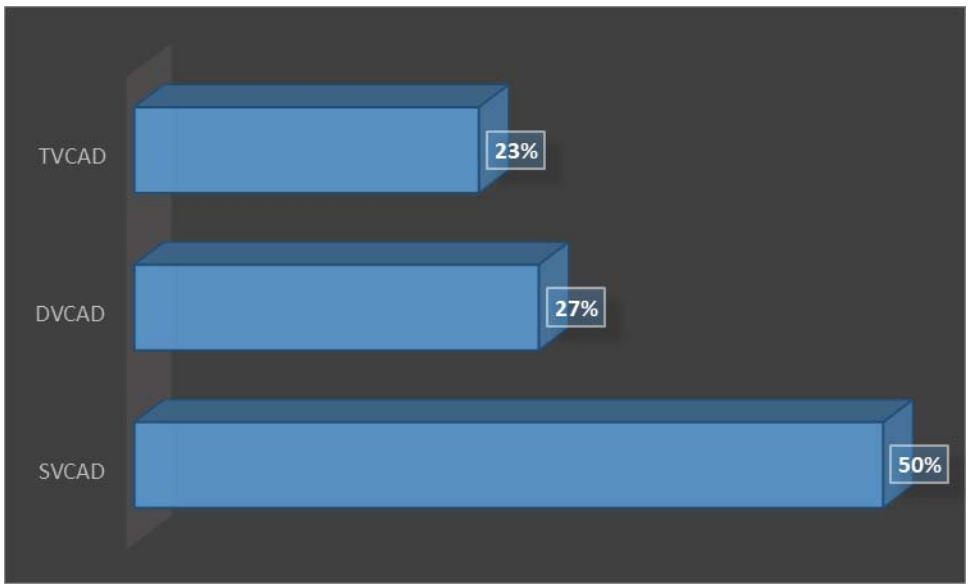

Figure-5: Angiographic pattern of study population

In table-3 shows Correlation of obesity with family history, smoking, occupation, physical activity, annual income, hypertension, BMI, Gender, heart diseases and age in patients where we found that mostly age and heart diseases strongly correlated with obesity than other variable. The following table is given below in detail:

Table-3: Correlation of obesity with family history, smoking, occupation, physical activity, annual income, hypertension, BMI, Gender, heart diseases and age in patients

CORRELATION OF OBESITY WITH	R-VALUE	P-VALUE
FAMILY HISTORY	-.229	<0.01
SMOKING	-.124	<0.01
INCOME	-.130	<0.01
OCCUPATION	.008	>0.05
PHYSICAL ACTIVITY	-.142	<0.01
HYPERTENSION	-.289	<0.01
BMI	.276	<0.01
GENDER	-.022	>0.05
AGE	-.285	<0.01
HEART DISEASES	-.286	<0.01

V. Discussion

This cross-sectional study was designed to determine the incidence of cardiac disease in obese Bangladeshi adults who were overweight or obese. As a major risk factor for cardiovascular disease (CVD) or heart disease, obesity must be addressed.

All research subjects had their blood pressure measured, and we found that the blood pressure of the obese group was statistically significantly greater than that of the normal weight group. Obesity was more prevalent in this study than in the previous one, as we found out during our research process. [6]

Overweight and obesity are significant problems in Bangladesh and other developing countries.

The prevalence of obesity is expected to be higher in older populations than in younger populations, such as Bangladesh and India, although studies have shown that hypertension is common in developing nations [7,8.]

As people age, they are more likely to become fat, which is in line with previous studies. [9]

According to this survey, 54 percent of males and 46 percent of females are obese. There was no statistically significant difference between males and females despite the greater incidence rate. People with heart disease are more likely to have obesity-related hypertension. Another study done in India's rural areas came to the same conclusion. When we looked at patients with positive cardiac illness, we found a significant prevalence of obesity.

Our research revealed that systolic and diastolic hypertension affected 24 and 28 percent of the 100 individuals, respectively. On the other hand, one research revealed that individuals with MI had a larger impact from elevated systolic blood pressure than from elevated diastolic blood pressure Endothelial damage induced by high systolic blood pressure might be the reason, leading to increased atherosclerosis. It has long been recognized that high levels of triglycerides, total cholesterol, and LDL cholesterol in the blood are associated with cardiovascular disease.

Similarly, obesity and salt consumption were linked in another research along with age, body mass index (BMI), physical inactivity (including smoking), and a family history of stroke/CVD. [5] The growing salinization of freshwater puts more than 35 million people in coastal Bangladesh at danger; increased salinity in drinking water has been related to higher blood pressure among youthful coastal populations. Since the majority of patients were from rural regions, they may not be aware of the hazards of drinking water salinity, which is why we found a high correlation with this report during the research.

Many individuals assume that cooking renders the salt safe. Weight gain, a recognized risk factor for coronary atherosclerosis (CAD), is considered to be made worse with an excessive salt intake.[10]

VI. Conclusion

We can draw the conclusion that obese individuals in Bangladesh have a higher risk of developing heart disease than other patients. In order to establish the prevalence of obesity in heart illness, more study is needed.

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