Body Mass Index Profile and Its Co-Relation in Patients of Coronary Heart Disease

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Abstract: The antecedent relative weight and weight gain after the age of 25 years to be strongly related to risk of angina pectoris in men. Obesity is an independent risk factor for genesis of coronary heart disease so it was planned to perform the present study to correlate the body mass index with coronary heart disease and data was taken from wards of SRG Hospital Jhalawar as material for the study. The routine blood and urine examinations with other clinical examinations were done and noted on pre-design Performa. Patients having other disease except CHD were excluded for the present study. The BMI of every patient was calculated and correlated with coronary heart disease. The result showed that >58% of the patients of coronary heart disease were having obesity. There was linear increase in calorie intake and significant increase in serum cholesterol levels with increase in BMI from lean to obese. The present study proved that the patients of CHD with obesity were above >45 years of age.[Subhash J NJIRM 2017; 8(3):78-80]

Key words: Coronary Heart Disease (CHD), Body Mass Index (BMI), Obesity, Angina Pectoris, Weight

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Introduction: Obesity is an independent risk factor for genesis of coronary heart disease.[1,2]

The risk of sudden death and angina pectoris in middle aged obese increases four times as compared to lean men of comparable age[1,2] The rise of hypertension in previously normotensive individuals was proportional to the degree of obesity.[3]

Obesity was labelled when subject's weight was 20% more than normal with age range as 36-50 years.[4]

Body Mass Index also known as obesity index: Body mass index = weight in kilogram divided by height in metre.[2,5,6]

Advantages of body mass index are: it is easy to calculate, there is no change from population to population. There is no time factor and it is independent of height. However, it does not distinguish between overweight due to obesity and one due to muscle hypertrophy.

Obese person is classified: on the basis of body mass index in following manner grade 0 20 – 24.9, Grade I 25.0 – 29.9, Grade II – 30.0- 40.0, Grade III More than 40.0.

Grade I – Obesity was associated with two-fold increase in incidence of coronary heart disease. Then men with body mass index >27 had 34.0% greater incidence of coronary heart disease than general population.

There is a strong relation in excessive incidence of coronary heart disease with obesity.[7]

Coronary Heart Disease: Manifests usually as angina pectoris, myocardial infarction or sudden death. Coronary heart disease occurs more frequently in patients with hypertension and diabetes mellitus.[8,9] Increase in weight is important in the genesis of hypertension, diabetes mellitus and coronary heart disease.[10]

This work is to study the role of body weight especially obesity using body mass index as a criterion for defining its role in coronary heart disease.

Methods: The study was conducted in admitted patients of SRG hospital & Medical College Jhalawar. 100 patients of coronary heart disease were taken as the material for the study. These patients were attending OPD or admitted in hospital. Detailed history was taken including history of risk factors for coronary heart disease viz. smoking, family history of obesity, hypertension, diabetes mellitus, gout, history of oral contraceptive pills in females.

Each patient underwent thorough clinical examination. In addition to routine blood and urine examination, blood sugar fasting, post glucose blood sugar, urea, total serum cholesterol, ECG (12 lead), X-ray chest, serum K^+ and Na^+ were done. Those patients suffered with hypothyroidism, Cushing syndrome, Nephrotic Syndrome, Liver Disease, Chronic renal failure, congestive heart failure and anemia were excluded. Cases were divided into three groups

according to BMI; those who have BMIbelow 19 were labelled as lean, ones with BMI 19 to 23 were normal weight individuals while in those cases where BMI was above 23 they were called obese (according to ICMR criteria).

The diagnosis of coronary heart disease in patients made by clinical history of retrosternal pain (Hubert et al Framingham study,1983):Angina pectoris or myocardial infarctionor with this history, electro cardioghraphic changes (Pathological Qwaves, ST Segment depression horizontal or down sloping of 1mm or more, or symmetrical T wave inversion). Enzyme estimation-raised SGOT,SGPT in cases of myocardial infarction.

Observation: The table showing that the majority of cases were above 45 years of age (84.0%) with coronary heart disease.

Table No- I Percentage frequency of age incidence in coronary heart disease.

Age in Years	CAD100 Patients	
	Male	Female
35	4 (5.12%)	1(2.85%)
36-45	9 (11.53%)	2(9.09%)
46-55	36 (46.15%)	9(40.90%)
55	29 (37.17%)	10 (45.45%)
Total	**78**	**22**

Table No. II Showing Body Mass Index in Coronary heart disease

Kg/Met^{2}BMI (Kg/Met^2)	CAD100 Patients			
	Male	Female	Total	%
19	08	01	09	09
19-23	22	11	33	33
23	49	09	58	58
Total	**79**	**21**	**100**	**100**

The table showing that 58% of patients with coronary heart disease were obese.

Table No. III Incidence of angina pectoris and myocardial infarction with relation to BMI

CAD	19	19-23	23
Angina Pectoris	05 (9.25%)	19 (35.18%)	30 (55.55%)
Myocardial Infraction	04 (8.69%)	14 (30.43%)	28 (60.86%)

When the subgroup of coronary heart disease was divided into those who had angina and those who had myocardial infarction, majority of the patients in each group had BMI above 23 (Angina Pectoris 55.55% and myocardial infarction 60.86%) only 9.52% cases with angina pectoris and 8-69% cases of myocardial infarction had body mass index less than 19, remaining were having normal body mass index. These findings were statistically significant (P <0.05).

Table No. IV Showing correlation of total serum cholesterol with BMI

Body Mass Index Kg/Met^2	CHD	
	Mean	S.D.
Up to 19	178.16	± 34.39
19-23	230.87	±40.19
23 and above	264.99	± 47.59

P> 0.05

Mean serum cholesterol level rose with increasing body mass index. These observations suggested the increasing body weight is associated with increasing levels of serum cholesterol.

Table No. V Showing correlation of total caloric intake/day with BMI

Body Mass Index Kg/Met^2	Coronary Heart Disease	
	Mean	S.D.
19	1888.88	±223.33
19-23	2084.84	±366.90
23	2336.20	±546.99

P=0.05

Discussion: Obesity was present in more than half of the cases having coronary artery disease. Obesity was present in 58% cases of coronary heart disease however there was not much significant difference in subgroup of angina pectoris where it was seen in 55% cases versus those who had myocardial infarction where its incidence was 60%. There was linear increase in caloric intake with increase in BMI in this sub group. This relationship appears self-explanatory. Similarly, there was statistically increase in serum cholesterol levels with increase in body mass index from lean to obese.[11]

Perhaps obesity has some direct correlation with serum cholesterol values. Similar observations have been made by Rif-kind et al and Henry et al in their observations on serum cholesterol levels and obesity in general population.[12]

We would like to remark that obesity was extremely common in patients with coronary heart disease in our population which is contrary to popular belief. In our study, BMI was taken as criteria to judge obesity which is said to be best index of obesity (Key et al, 1972).One point which comes out from our study is that serum cholesterol rose with increasing body mass index in cases who had coronary heart disease.

Conclusion: 58% of CHD patients studied for BMI correlated were above 45 years of age.100 patients were studied of CHD of which 79.0% were males. Incidence of obesity was 58% and there was no significant difference in BMI between sub group of angina and myocardial infarction. In all the CHD patients mean serum cholesterol rose with increasing BMI.

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