ORIGINAL ARTICLE

Frequency of Metabolic Syndrome in Patients with Ischemic Heart Disease

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ABSTRACT

Aim: To determine the frequency of metabolic syndrome in patients with ischemic heart disease.
Study Design: It was an Observational, cross sectional study.
Place of study: Indoor, outdoor & emergency departments of Medicine, Islam Medical College, Sialkot.
Duration: From February 2014 to February 2015.
Method: A total of 100 patients fulfilling the inclusion criteria were included in study. Demographic data (age and gender) and the 5 components conditions of the metabolic syndrome were noted. Subjects were physically assessed for the abdominal obesity, based on waist circumference. Fasting blood samples for glucose and lipid profile in first 24 hours after acute coronary insult were drawn and tested in central laboratory. Variables were processed for descriptive statistic.
Results: In this study population, 56% were male and 44% were female with mean age of 64+5.61 years in men and 57+8.25 years in women. Frequency of metabolic syndrome was 34% in men and 30% in women. It increased with age. The highest rate of metabolic syndrome was found in men diagnosed as STEMI.
Conclusion: Frequency of metabolic syndrome was high among patients with ischemic heart disease. It supports the potential for preventive efforts in patients with ischemic heart disease.
Keywords: Ischemic Heart Disease, Metabolic Syndrome, Blood Pressure, Obesity.

INTRODUCTION

Worldwide, ischemic heart disease (IHD) is considered as a leading cause of mortality and may cause 1 of every 5 deaths in the United States in 2004[1]. In 2008, an estimated 770000 Americans had a new coronary attack.[1] Ischemic heart disease is common not only in developed countries but is also a rising epidemic in developing countries.[2] Men and women are at equal risk in Pakistan[3].

Among the etiologies, metabolic syndrome is an important risk factor for the development of cardiovascular disease with prevalence of 22% in both male and female[4,5]. Metabolic syndrome is considered as the presence of any three of the following five traits: Abdominal obesity (waist circumference >40 inches in men & >35 inches in women), serum triglycerides > 150 mg/dl, serum HDL cholesterol <40 mg/dl in men and <50 mg/dl in women, blood pressure > 130/85 mmHg or fasting plasma glucose > 110mg/dl[6].

Metabolic syndrome is group of risk factors that increases the risk for cardiovascular diseases[4]. Normal weight people meeting ATP-III criteria for metabolic syndrome has three fold increased risk for cardiovascular disease[7]. The increased risk appears

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due to risk factor clustering or insulin resistance associated with metabolic syndrome rather than simple obesity[8]. Insulin resistance, the associated hyper-insulinemia & hyperglycemia lead to endothelial dysfunction & vascular inflammation promoting the development of atherosclerotic cardiovascular disease[9].

Uptil now very limited data is available in our country regarding frequency of metabolic syndrome in patients with ischemic heart disease, however, we planned this review to find out the frequency of metabolic syndrome in patients of ischemic heart disease so that early interventions can be made to reduce mortality, due to metabolic syndrome as a definite risk factor for ischemic heart disease.

MATERIAL AND METHODS

A total of 100 diagnosed cases of ischemic heart disease between 30-70 years of age of both gender were included in the study from indoor, outdoor & emergency departments of medicine, Islam Medical College, Sialkot. We excluded those cases with recent or prior stroke on history, known patient of chronic renal failure, known patient of chronic obstructive pulmonary and having familial hypercholesterolemia, diagnosed on fasting lipid profile. Patients were informed regarding inclusion of their data in this research.

Subjects were assessed for the five components conditions of metabolic syndrome. Blood pressure was measured by using a standard sphygmomanometer after the subject had been seated for at least 5 minutes. The mean value of two measurements taken at least one minute apart was used in the analysis. Fifth-phase Korotkoff sound was used for diastolic blood pressure. Abdominal obesity based on waist circumference was measured at narrowest point between umbilicus and bottom of ribcage by measuring tape with same observer.

Fasting blood samples were drawn for glucose and lipid profile in first 24 hours after acute coronary insult. Metabolic syndrome was defined by the presence of 3 or more out of 5 components; abdominal obesity (waist circumference102/88cm (men/women); fasting plasma glucose > 110 mg/dl; Serum triglycerides >150 mg/dl; high density lipoprotein cholesterol <40/50 mg/dl (men/women); Blood pressure > 130/85 mmHg.

Ischemic heart disease was diagnosed by the criteria of previous history of typical chest pain with electrocardiographic changes of myocardial infarction, acute coronary syndrome and stable angina pectoris. We used SPSS Version 17 for data analysis of the patients.

RESULTS

Mean age of the patients was 60.5 years. 7 patients (7%) were in the age range of 35 to 45 years. 31 patients (31 %) out of total 100 were in age range of 46 to 55 years. 41 patients (41%) were lying in range of 56 to 65 years and only 21 patients (21 %) were of more than 65 years of age. Mean age of male patients was 64+5.61 years while of female patients was 57+8.25 years. Age detail is given in Table 1.

Out of 100 patients 56 (56 %) patients were male & 44(44%) patients were female. Male to female ratio was 1.27: 1. Sex distribution is given in Table 2.

All the patients at the time of diagnosis were having ischemic heart disease, however metabolic syndrome was found to be present in 32(32% of study population) patients. Frequency of metabolic syndrome was 34% (19 males) for men and 30% (13 women) for women.

The characteristics of the study population as well as the gender wise distribution of variables are presented in table 2.

The most frequent component of metabolic syndrome found in study population was the raised fasting blood sugar level, found in 59% of the study population, followed by the raised triglycerides which were raised in 49% of the total study population. High density lipoproteins were raised according to NCEP,

ATP III in 48% patients. 45% patients have increased waist circumference. Blood pressures were raised in 36% of patients. The frequency of components of metabolic syndrome is presented in table 3.

Table 1: Age distribution (n=100)

Age(in years)	n	%age
35-45	7	7
46-55	31	31
56-65	41	41
>65	21	21
Total	100	100

Table 2: Gender - wise distribution of variables. (n=100)

Variables	Males	Females
Gender	n = 56	n = 44
Age in years (mean + SD)	64 + 5.61	57 + 8.25
Fasting Blood Sugar (mg / dl)	164 + 19.6	176 + 11.8
Systolic BP (mm/Hg)	160 + 15.0	150 + 10
Diastolic BP (mm/Hg)	95 + 10.0	90 + 8.0
Triglycerides (mg/dl)	156.5 + 48.22	169.35 + 56.59
HDL (mg/dl)	38 + 6.5	43.5 + 7.2
Waist Circumference (cm)	97.4 + 9.7	105.8 + 12
STEMI	35 %	23 %
NSTEMI	9 %	7 %
ST-T Changes	12 %	14 %

Table 3: Frequency of components of metabolic syndrome (n=100)

Variable	n
Blood Pressure > 140/90 mmHg	36
Fasting Blood Sugar > 110 mg/dl	59
Triglycerides > 150 mg/dl	49
Increased Waist Circumference	45
Increased High Density Lipoproteins	48

DISCUSSION

Metabolic syndrome -- a symptom cluster that can include abdominal obesity, low HDL cholesterol level & elevated triglyceride, blood pressure, and fasting glucose levels -- is receiving heightened attention because of its increasing frequency and its association with cardiovascular disease. The commonly accepted underlying risk factors for Metabolic Syndrome include insulin resistance & abdominal obesity.

The patients presenting to our hospital with ischemic heart disease were not representative of any specific area or socioeconomic class however, belonging mainly to middle to lower socioeconomic strata. The study included a total of 100 consecutive ischemic heart disease patients, all presented with acute coronary syndrome proven by history, EKG & cardiac enzymes.

We compared our study results with the other internationally published data. In a study done by Nadri et al in Bangalore, India which included 220 patients, the Frequency of metabolic syndrome was found to be 38.6% as compared to our study which showed the Frequency of metabolic syndrome up to 32%. This difference is likely attributable to mean age, which was 60.5 years in our study population as compared to 46.6 years in above mentioned study, as we know that the incidence of both metabolic syndrome as well as ischemic heart disease increases with age. This Indian study also showed the male preponderance in patients with metabolic syndrome having acute coronary syndrome, in this regard the results were similar to our study results. Our study showed that there is markedly increased incidence of ST segment elevation myocardial infarction i.e., approx 62% in patients having metabolic syndrome, compared to Indian data which showed approx 72.9% incidence of same.

In a study done by Zarich S et al, which included 165 consecutive subjects who presented with myocardial infarction, metabolic syndrome with or without overt diabetes was present in nearly two thirds of patients. The incidence & the results of Frequency of metabolic syndrome was almost similar to our study, however this study only included patients with less than 45 years of age.

In a large study done by Zaliunas R et al in Lithuania, which included 2756 patients with acute ischemic syndromes, the metabolic syndrome was found to be present in (1641 out of 2756) 59.5 % patients as compared to our study results i.e., 32%. The results are quite similar & comparable to our study despite having a very large sample size.

The study results of Zaliunas R et al are different when we analyze the frequency of different components of metabolic syndrome in comparison to our study. In this particular study the most common component among both males and females was the arterial hypertension i.e., 94 % as compared to our study results which has the highest incidence of diabetes i.e., 59 %. One thing of particular interest was that in study done by Zaliunas R et al the metabolic syndrome was significantly more common in women than in men (70.2% *vs.* 52.6%), as compared to our study which showed slightly raised incidence of metabolic syndrome among male population (34% vs. 30%), however keeping in mind that our sample population was very small as compared to this study. The mean age was also approximately similar to our study i.e., 60.5 years in our study and 64years in this particular study.

In a study done by Zeller M et al which included 633 patients with acute myocardial infarction 290 (46 %) patients fulfilled criteria for metabolic syndrome. This study also showed that frequency of metabolic syndrome was a little higher in older population similar to our study. However the results of this study showed increase Frequency among female population as compared to our study in which males were at risk.

The metabolic syndrome is a well known risk factor for the development of the ischemic heart disease & a significant number of patients in our study were found to have metabolic syndrome. The present study shows that the symptom complex of metabolic syndrome is strongly associated with ischemic heart disease. Patients with metabolic syndrome should have early intervention to decrease the risk factors & life style modification to prevent the sequalea of IHD and its complications, ultimately reducing the cardiovascular mortality.

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