EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 7
Issue: 8
578-582
Year: 2020

FREQUENCY OF METABOLIC SYNDROME IN PATIENT WITH ISCHEMIC HEART DISEASE

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Article Received on 21/06/2020 **Article Revised on 11/07/2020** **Article Accepted on 31/07/2020**

ABSTRACT
The objective of current study is to determine the frequency of different component of metabolic syndrome among patients with IHD presenting at a teaching hospital. This was a Cross-Sectional study performed at a tertiary care hospital of Lahore, in a duration of 3 month from 1st January 2020 to 31th March. There were total 195 patients were enrolled in study presented with IHD. The sampling was done through Non-probability sampling technique. Metabolic syndrome was found to be present in 61.5 % of patients. 53.8% were males and 46.2% were females with ratio of 1:1.16. We found that 101 (51.7%) patients were obese in our study. Out of 101, ninety six were having ischemic heart disease. There were 97 (49.7%) of the patients with high triglycerides level and out of these 82 were having ischemic heart disease. Eighty (41%) of the total patients with low HDL values, out of these eighty, 49 patients were having ischemic heart disease. 39% of the total Hypertensive IHD patients were having metabolic syndrome. The most frequent component of metabolic syndrome found in our patients was the raised fasting blood sugar level i.e. 107 (54.8%) of total patients. And out of these 107 patients, 91.5% were having metabolic syndrome associated IHD.

KEYWORDS: IHD, Metabolic Syndrome, Obesity, Hypertension, FBS.

INTRODUCTION
IHD is a worldwide health problem with the highest mortality rate per year being 12.2%.[1,2] The European region currently has the highest mortality rate, followed by Southeast Asian.[3] Ischemic heart disease is a growing epidemic not only in developed countries but also in developing countries. More than 30% of patients over the age of 45 in Pakistan suffer from ischemic heart disease.[4] Therefore, it is necessary to evaluate individual ischemic heart disease risk factors. There is a disparity between oxygenated blood supply and demand to the heart due to atherosclerotic lesions in the coronary arteries. IHD ranges from transient angina to NSTEMI and STEMI.[5] Causes of ischemic heart disease are multifactorial i.e, age, sex, family history, genetic factor, smoking, hypertension, diabetes, obesity, hyperlipidemias, stress and sedentary lifestyle.[6] The metabolic syndrome is a group of the most frequent ACS risk factors: diabetes and raised FBS, increased waist circumference (central obesity), hypertriglyceridemia and high blood pressure.[7] It has a wide range of complications, including cerebrovascular and cardiovascular problems such as stroke, ischemic heart disease, heart failure, aortic stenosis and atrial fibrillation.

Metabolic syndrome is one of the major public health problems of this century. Metabolic syndrome was first defined by the WHO in 1998 insulin resistance is a major risk factor of Metabolic syndrome.[8]

According to the new IDF definition, a person should be defined as having metabolic syndrome: central obesity (waist circumference >40 inches in men & >35 inches in women) plus any two of the following four factors: Raised serum triglycerides ≥ 150mg/dL or reduced HDL cholesterol i.e., <40mg/dL in males <50mg/dL in females, blood pressure > 130/85 mmHg or fasting plasma glucose > 110mg/dl. Simply, it is group of cardiovascular disease risk factors characterized by central obesity, increased FBS, raised serum triglycerides, reduced HDL and hypertension.[9] Metabolic syndrome is an independent risk factor for myocardial infarction.

It is estimated that 20% -25% of South Asians develop MS, and many more are affected. Urbanization, economic growth, irregular diet and westernization of food have been cited as culprits in the development of disease.[10] The root cause of metabolic syndrome continues to challenge experts, but both insulin resistance and central obesity are considered important factors. Genetic, physical inactivity, aging, inflammatory

status, and hormonal changes may have a causal effect, but their role may vary according to ethnic group.[11,12]

The incidence of metabolic syndrome is increasing day by day in Asia and now it has become a major public health problem. The incidence of MS in Pakistan is reported to be between 18% and 46% of the adult population.[13,14]

These mentioned facts explain the clear link between metabolic syndrome and ischemic heart disease. Complications are more likely to occur in patients with metabolic syndrome. Therefore, patients with metabolic syndrome should be given high priority during the evaluation of risk factors for early aggressive intervention. Very limited data are now available in our country about the frequency of metabolic syndrome in patients with ischemic heart disease. We planned this review to find out the frequency of metabolic syndrome in patients with ischemic heart disease. Early detection of risk factors in the population of Pakistan can prevent the devastating consequences of myocardial ischemia.

METHODOLOGY

Study design: Cross-Sectional, Descriptive study.
Place of study: Punjab Institute of Cardiology Lahore.
Duration of study: 3 months duration from 1st January 2020 to 31th March.
Sample size: A total of 195 patients were included with IHD.
Sampling technique: Non-probability purposive sampling.
Inclusion criteria: Patients presenting with stable angina, unstable angina, ST-elevation MI, and non ST Elevation MI.
Exclusion criteria: patient presenting with co-morbidities i.e. renal failure, hepatic failure, hyperthyroidism, cerebral stroke, and valvular heart diseases.

A preformed questionnaire was used to interview the selected patients and data was analyzed using SPSS. Informed consent was taken. The purpose and process of study was explained to all the patients. Ethical approval was not needed as no invasive procedure was done.

RESULTS

Mean age of the patients was 56±8.8 years. 29 (14.8%) patients were in the age range of 30 to 45 years. 94 (48.2%) patients out of total 195 were in age range of 46 to 60 years and only 72 (37%) patients were of more than 61 years of age. All the patients at the time of diagnosis were having ischemic heart disease, however metabolic syndrome was found to be present in 61.5% of patients. 53.8% were males and 46.2% were females with ratio of 1:1.16. We found that 101 (51.7%) patients were obese in our study. Out of 101, ninety six were having ischemic heart disease. There were 97 (49.7%) of the patients with high triglycerides level and out of these 82 were having ischemic heart disease. Eighty (41%) of the total patients with low HDL values, out of these eighty, 49 patients were having ischemic heart disease. 39% of the total Hypertensive IHD patients were having metabolic syndrome. The most frequent component of metabolic syndrome found in our patients was the raised fasting blood sugar level i.e. 107 (54.8%) of total patients. And out of these 107 patients, 91.5% were having metabolic syndrome associated IHD. Results are summarized in the tables.

Table 1: Age distribution.

Age group	Frequency	Percentage
30-45 years	29	14.8%
46-60 years	94	48.2%
61 and above	72	37%
Total	195	100%

Table 2: Gender distribution.

Sex	No. of patients	Percentage
Male	105	53.8%
Female	90	46.2%
Total	195	100%

Table 3: Frequency of Metabolic Syndrome.

Metabolic syndrome	Frequency	Percentage
Yes	120	61.5%
No	75	38.5%
Total	195	100%

Table 4: Frequency of different component of metabolic syndrome.

Component	Frequency	Percentage
Blood pressure > 140/90 mmHg	76	39%
FBS > 110 mg/dl	107	54.8%
Triglycerides > 150 mg/dl	97	49.7%
Obese (Inc. waist circumference)	101	51.7%
Dec. HDL	80	41%

Table 5: Type of Ischemic Disease.

Type	Frequency	Percentage
NSTEMI	95	48.7%
STEMI	30	15.3%
Unstable Angina	70	35.8%

Table 6: Baseline Characteristics.

Mean age	56±8.8 years
History of smoking	107 (54.8%)
Systolic blood pressure	140 ± 20.4 mmHg
Diastolic blood pressure	85 ± 9.8 mmHg
HDL	55.8 ± 14.9 mg/dl
Triglycerides	123 ± 35.3 mg/dl
FBS	125 ± 40.4 mg/dl

DISCUSSION

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. 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 central obesity and insulin resistance.

There were 195 patients in our study presented with Ischemic Heart Disease. Among 195 patients, 105 were males (53.8%) and 90 were females (46.2%). For identification of patient having metabolic syndrome IDF defining criteria was used. 120 patients out of total 195 were having Metabolic Syndrome i.e., 61.5% of the total IHD Patients. 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%.[8] In another study performed in Lahore resulted the frequency of MS was 53.87% according to IDF criteria.[15] A study in Spain resulted the prevalence of Metabolic syndrome was 39.99%.[9] In a report of US population, it was observed that about 46% of metabolic syndrome in adults.[16] A study in Pakistan showed higher prevalence of metabolic syndrome with diabetes as 70%.[17]

Among these 70 (58.3%) were males while 50 (41.6%) were females. In a previous research Metabolic Syndrome was more prevalent among Females than Males, so gender doesn't play significant role in defining the metabolic syndrome among IHD patients.[18] There were 101 (51.7%) obese patients in our study. Approximately 95% out of these obese patients were suffering from metabolic syndrome. Hence obesity showed significant impact in defining metabolic syndrome. In a previous study done by Dirk De et al, only 31% of the patients of IHD were obese.[19] So frequency of central obesity among IHD patients in our study was much more as compare to previous studies.

There were 97 (49.7%) patients having increased Triglycerides level in blood plasma. Among these 97 patients, 80 (82.4%) were having ischemic heart disease. So, hypertriglyceridemia can be considered as a significant variable in determining Metabolic Syndrome. According to another research work done in Iran by ZN Hatmi, et al, in year 2009, 32% of the patients of IHD were having hypertriglyceridemia.[20]

There were 80 (41%) patients having decreased HDL level in their blood. Among these 80 patients, 49 (61.25%) were having ischemic heart disease indicating a clear relationship between these two and similar results were seen in international studies.[21]

Seventy Six patients (39%) out of total 195 were Hypertensive. Out of these 76 patients, 53 (69.7%) were suffering from ischemic heart disease. This shows that as stated by IDF criteria, Hypertension has got a major role in determining the patients of ischemic heart disease.

107 (54.8%) patients out of total 195 were having fasting blood glucose levels above the cut off value. Out of these 107 patients, 98 (91.5%) were suffering from metabolic syndrome associated IHD. We found that raised FBS was most commonly associated with IHD. A research

conducted in Pakistan in 2016 showed that 28% of patients with ischemic heart disease were suffering from type 2 diabetes.[22] Our study indicates increased prevalence of diabetes in IHD patients as compared to that previous research.

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 sequelae of IHD and its complications, ultimately reducing the cardiovascular mortality. Patients with metabolic syndrome are twice as likely to have heart disease in the next 5 to 10 years as non-syndrome individuals.[23]

CONCLUSION

A high frequency (61.5 %) of Metabolic Syndrome in Ischemic Heart Disease patients takes us to a conclusion that presence of metabolic syndrome is an important risk factor of IHD. Also, the most frequent component of metabolic syndrome found in study population was the raised fasting blood sugar level followed by obesity.

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