# Frequency of Metabolic Syndrome in Patients with Ischemic Heart Disease Presenting to a Tertiary Care Hospital of Lahore

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## ABSTRACT

The frequency of patients with Ischemic Heart Disease is increasing in our society. Obesity, Triglyceridemia, Decreased HDL, Hypertension and Diabetes are among the factors that determine risk of ischemic heart disease. The aim of our study was to see the frequency of metabolic syndrome in patients with ischemic heart disease presenting at a tertiary care hospital of Lahore. Study was a cross sectional descriptive study of 1 month duration carried out at Punjab Institute of Cardiology (PIC) Lahore. A structured Questionnaire was used to interview the patients.

**Keywords:** Metabolic syndrome, Ischemic Heart Disease, obesity.

## INTRODUCTION

Ischemic Heart Disease(IHD) is the generic designation for a group of patho-physiologically related syndromes resulting from myocardial ischemia, an imbalance between the supply and demand of the heart for oxygenated blood. In more than 90% of cases, the cause of myocardial ischemia isreduced blood flow dueto obstructive atherosclerosis lesions in the coronary arteries. Pathologically the dominant cause of IHD is insufficient coronary perfusion relative to myocardial demand, due to chronic, progressive atherosclerotic narrowing of epicardia coronary arteries and variable degreesof superimposed acute plaque change, thrombosis and vasospasm[1].

IHD is the leading cause of death worldwide with 7.2 Million deaths and 12.2% of total deaths per year[2]. The highest coronary mortality is seen at present in the European Region followed by South-East Asian Region[3].

The etiology of IHD is multi-factorial. Age, sex, family history and genetic factors are major non-modifiable risk factors. Modifiable risk factors include cigarette smoking, alcohol, high blood pressure, elevated serum cholesterol, diabetes, obesity, sedentary habits and stress[2].

The metabolic syndrome is a cluster of the most dangerous heart attack risk factors: diabetes and raised fasting plasma glucose, abdominal obesity, high cholesterol and high blood pressure[4]. It is estimated that around 20-25 percent of the world's adult population have the metabolic syndrome and they are twice as likely to die from and three times as likely to have a heart attack or stroke compared with people without the syndrome[5].

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The underlying cause of the metabolic syndrome continues to challenge the experts but both insulin resistance and central obesity are considered significant factors. Genetics, physical inactivity, aging, a pro-inflammatory state and hormonal changes may also have a causal effect, but the role of these may vary depending on ethnic group[6,7]. Metabolic syndrome increases the risk of coronary artery disease by 7.3 times in males and 10.2 times in female patients[8].

According to the new IDF definition, for a person to be defined as having the metabolic syndrome they must have: Central obesity (defined as waist circumference with ethnicity specific values) plus any two of the following four factors: Raised triglycerides i.e., abnormality ≥ 150mg/dL or reduced HDL cholesterol i.e., <40mg/dL in males <50mg/dL In females or raised blood systolic BP ≥ 130 or diastolic BP ≥ 85mmHg pressure or treatment of previously diagnosed hypertension or raised fasting (FPG) type 2 diabetes[9] ≥100mg/dL plasma glucose.

These mentioned facts elaborate a clear relationship between metabolic syndrome and Ischemic Heart disease. However the data in this regard about metabolic syndrome and ischemic heart disease presentation of patients from Lahore is deficient. This study is designed to be a pilot study to add this information. Doing such a research in Lahore, Pakistan will be helpful for health education and awareness of people regarding the two and hence prevention from the fatal disease by adopting healthy lifestyle and preventive measures.

## MATERIALS AND METHODS

This study was a Cross-Sectional, Descriptive study carried out at Punjab Institute of Cardiology (PIC) Lahore. A total of 76 patients were included in the study who were adult male and female patients with Ischemic Heart disease presenting to the outpatient department. People having renal failure,

hepatic failure, and cerebral stroke were excluded from the study. A structured questionnaire was used to interview the chosen subjects and data was analyzed. All the subjects were explained the purpose and the process of study. The benefits of study were explained.

The objective of the study was to see the Frequency of Metabolic Syndrome in patients with Ischemic Heart Disease at a tertiary care hospital of Lahore over a period of 1 month.

## RESULTS

Seventy five percent of total IHD patients were suffering from Metabolic Syndrome. Among these 53% were males while 47% were females. 91% of the total obese were having Metabolic Syndrome. 88% of the total patients with Triglyceridemia were having Metabolic syndrome. 84% of the total patients with low HDL values were suffering from Metabolic Syndrome. 80.3% of the total Hypertensive IHD patients were having Metabolic syndrome. 85.7% of total patients with increased fasting blood glucose levels were suffering from metabolic syndrome. Role of Gender, Occupation, Educational status, marital status, Smoking, Exercise, Stress and Fast food restaurant visits were insignificant in determining the metabolic syndrome. Results are summarized in the tables.

Table 1: Metabolic syndrome

| Metabolic syndrome | n | Male | Female |
|---|---|---|---|
| Yes | 57 | 30 | 27 |
| No | 19 | 10 | 9 |
| Total | 76 | 40 | 36 |

Table 2: Frequency distribution of different risk factors in relation to metabolic syndrome

| Frequency distribution of persons having (% of total count) | Frequency Distribution Of Persons Having Metabolic Syndrome | |
|---|---|---|
| | No | Yes |
| Waist measurements above cut off value | | |
| No | 14(18.4%) | 0 |
| Yes | 5(6.6%) | 57(75%) |
| Triglyceride levels above cut off value | | |
| No | 12(15.8%) | 5(6.6%) |
| Yes | 7(9.2%) | 52(68.4%) |
| HDL levels below cut off value | | |
| No | 11(14.5%) | 14(18.4%) |
| Yes | 8(10.5%) | 43(56.6%) |
| HDL levels below cut off value | | |
| No | 7(9.2%) | 8(10.5%) |
| Yes | 12(15.8%) | 49(64.5%) |
| Fasting glucose above cut off value | | |
| No | 14(18.4%) | 27(35.5%) |
| Yes | 5(6.6%) | 30(39.5%) |

Table 3: Frequency of social factors (n=76)

| | Yes | No |
|---|---|---|
| Married | 69 | 7 |
| Smoker | 19 | 57 |
| Exercise | 46 | 30 |
| Stress | 37 | 39 |

## DISCUSSION

Our Research was carried out on 76 patients of Ischemic Heart Disease visiting the OPD of Punjab Institute of Cardiology. Among these 76, 40 were males (53%) and 36 were females (47%). IDF Criteria of defining the Metabolic Syndrome was used for identifying the patients having Metabolic syndrome.

Fifty seven patients out of total 76 were having Metabolic Syndrome i.e., 75% of the total IHD Patients. Among these 30(53%) were males while 27(47%) were females. In a previous research Metabolic Syndrome was more prevalent among Females than Males[10], so gender seems to have no influence in determining the metabolic syndrome among IHD patients (Gender comes out to be insignificant after applying Chi-Square test).

Sixty two persons (81.6%) out of total 76 were obese (according to IDFcriteria). 57(91.9%) out of these 62 obese patients were suffering from Metabolic syndrome. Hence obesity shows to have a significant influence in determining metabolic syndrome. (Obesity proves to be significant according to Chi-Square tests. In a previous result done by Dirk De backer and Guy De Backer, only 31% of the patients of IHD were obese[12]. So prevalence of obesity among IHD patients according to our stud were much more in comparison with the previous studies.59(77.6%) were having increased Triglycerides level in blood plasma.52(88%) out of these 59patients were having metabolic syndrome. So, Triglyceridemia can be considered as a significant variable in determining Metabolic Syndrome. (Chi-square test results show the same. According to another research work done in Iran by by ZN Hatmi, S Tahvildari, A GafarzadehMotlag and A SabouriKashani in year 2007, 32% of the patients of IHD were having Triglyceridemia[15].

51(67%) patients out of 76 were having Decreased HDL levels in their blood (an important risk factor for IHD). 43(84.3%) out of these51 patients were suffering from Metabolic syndrome indicating a clear relationship between these two. After applying chi-square test, relationship between decreased HDL and Metabolic Syndrome turned out to be significant which is in line with international studies[16].

Sixty one patients (80.3%) out of total 76 were Hypertensive. 49(80.3%) out of these 61 Hypertensive IHD patients were suffering from

metabolic syndrome. This shows that as stated by IDF criteria, Hypertension has got a major role in determining the patients of ischemic heart disease.35 (46.1%) patients out of total 76 were having fasting blood glucose levels above the cut offvalue and most of them were taking treatment for the diabetese. 30 out of these 35 patients were positive for metabolic syndrome showing an important relationship between increased fasting blood glucose and metabolic syndrome in IHD patients. Chi-square test results prove the significance. A previousresearch Conducted in Pakistan in year 2012 showed that 28% of patients with ischemic heart disease were suffering from type 2 diabetes[13]. Our study indicates increased prevalence of diabetes in IHD patients as compared to that previous research.

19(25%) patients out of total 76 IHD patients were smokers. 16 out of these 19 patients were suffering from Metabolic syndrome. These results show that the role of smoking in determining Metabolic syndrome is insignificant. In a study carried out in USA 24.1% of individuals with ischemic heart disease were Smokers[17].

Role of Occupation, Marital status and educational status were insignificant in determining the metabolic syndrome in IHD. Similarly exercise, Stress and Fast food restaurant visits were insignificant in determining Metabolic Syndrome in Ischemic Heart Disease patients. Findings are similar to other studies[11,14,18].

## CONCLUSIONS:

A high frequency (75 %) 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, Obesity proves to be the most important component of Metabolic Syndrome with a frequency of 91%.

## REFERENCES

1. Robins &Cotran. (2010) Pathological Basis of Disease.8Th Ed Philadelphia : Saunders Elsevier.
2. Park,JE. (2009) Preventive and Social Medicine. 20Th Ed.Jabalpur,India: BanaridasBhanot.WHO (1984). World Health Status. Annual.
3. Alberti KG, Zimmet P, Shaw J; IDF Epidemiology Task Force Consensus Group.
4. The metabolic syndrome-a new worldwide definition. Lancet 2005;366:1059-62.
5. www.idf.org/metabolic_syndrome, website of the International Diabetes Federation
6. Saad MF, Lillioja S, Nyomba BLet al. Racial differences in the relation between blood pressure and insulin resistance. New England Journal of Medicine 1991;324:733-9.
7. Anderson PJ, Critchley JAJH, Chan JCN et al. Factor analysis of the metabolic Chaudhary GM. Metabolic syndrome X in diabetic patients experience in 3275 diabetic patients at Jinnah Hospital, Lahore. J Coll PhysiciansSurg Pak 2000; 10: 278-80.
8. Chaudhary GM. Metabolic syndrome X in diabetic patients experience in 3275 diabetic patients at Jinnah Hospital, Lahore. J Coll PhysiciansSurg Pak 2000; 10:278-80.
9. http://www.idf.org/webdata/docs/IDF_Meta_def_final.pdf
10. Gorter, Petra M et al. Prevalence of the metabolic syndrome in patients with coronary heart disease,cerebrovascular disease, peripheral arterial disease or abdominal aortic aneurysm. Atherosclerosis, 2004, 4 ,173(2): 361 – 367.
11. Heather L. KobalMelanieBesculidesBrianGoeslingHilary M. SchwandtJosef CoreshMichelle J. Hindin. Marital Status, Hypertension, Coronary Heart Disease, Diabetes, and Death Among African American Women and Men: Incidence and Prevalence in the Atherosclerosis Risk in Communities (ARIC) Study Participants.Journal ofFamily Issues , MARCH 2010 , Vol 31, Issue 9, pp. 1211 – 1229.
12. Dirk DeBacquer, for the EUROASPIRE II Study Group, Guy De Backer, for the EUROASPIRE II Study Group, DennisCokkinos, for the EUROASPIRE II Study Group, Ulrich Keil, for the EUROASPIRE II Study Group,MichèleMontaye, for the EUROASPIRE II Study Group, ErikaÖstör, for the EUROASPIRE II Study Group,KaleviPyörälä, for the EUROASPIRE II Study Group, Susana Sans, for the EUROASPIRE II Study Group; Overweight and obesity in patients with established coronary heart disease: Are we meeting the challenge?. EurHeart J 2004; 25 (2): 121-128
13. KhanKhuwaja, A. , Nawaz Ali, F. , Naqvi, I. , Bux, R. , Jabbar, A. and Hassan Dhanani, R. (2012) Metabolic syndrome and its individual components among people with type 2 diabetes: Prevalence, gender differences and its association with ischemic heart disease. Journal ofDiabetes Mellitus, 2, 332.
14. Kalra S, NarainS, KarkiP, Ansari JA,RanabhatK, Basnet N. Prevalence of risk factors for coronary artery disease in the community in eastern Nepal--a pilot study. J AssocPhysicians India. 2011 May; 59:300-1.
15. ZNHatmi, S Tahvildari, A GafarzadehMotlagand A SabouriKashani. Prevalence of coronary artery disease risk factors in Iran: a population based survey.BMC CardiovascularDisorders2007
16. KUKLINA EV, YOON PW, KEENAN NL. Ann FAMMed 2010; 8:327-333
17. O'CONNOR CM , GURBEL PA , SEREBRUANY VL .Depression as a Risk Factor for Cardiovascular and Cerebrovascular Disease: Emerging Data and Clinical Perspectives. AHJ Volume 140, Issue 4, Supplement, October 2000, Pages S63-S69.
18. http://www.health.umn.edu/media/releases/fast-food-in-singapore