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METABOLIC SYNDROME IN PATIENTS OF ACUTE CORONARY SYNDROME

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Abstract:
Introduction: *Metabolic syndrome, also referred to as insulin resistance syndrome, is a cluster of risk factors in an individual that may precede type 2 diabetes mellitus. It is also associated with an increased risk of cardiovascular disease.* ***Objectives:*** *The main objective of the study is to analyse the metabolic syndrome in patients of acute coronary syndrome.* ***Material and methods:*** *This cross-sectional study was conducted in SIMS, Lahore during June 2019 to December 2019. Clinical histories from inpatients with ACS admitted to coronary or intensive care units in hospital were selected for this study. Demographic and clinical data were obtained from the clinical histories.* ***Results:*** *The total prevalence of MS using ATPIII criteria was 50.9% (292 patients). We found no MS components in 29 patients (5.1%), 1 in 96 (16.7%), 2 in 157 (27.4%), 3 in 135 (23.5%), 4 in 115 (20%), and all 5 in 42 (7.3%) patients. The most frequent component of MS was carbohydrate metabolism disorder, followed by reduced HDLc levels, hypertension, hyper triglyceridemia and, in last place, obesity. In total, 85.3% had carbohydrate metabolism disorder and the same percentage had low HDLc levels; 80.5% had hypertension, 65.4% had hypertriglyceridemia, and 51.7% had a BMI above the established cutoff point.* ***Conclusion:*** *It is concluded that women with ACS show a higher prevalence and a greater number of components of MS than men.*

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INTRODUCTION:

Metabolic syndrome, also referred to as *insulin resistance syndrome*, is a cluster of risk factors in an individual that may precede type 2 diabetes mellitus. It is also associated with an increased risk of cardiovascular disease. In 2001, the National Cholesterol Education Program (NCEP) Adult Treatment Panel (ATP) III provided a new definition for metabolic syndrome. The definition incorporates thresholds for the following 5 variables: waist circumference; concentrations of triglycerides, high-density lipoprotein (HDL) cholesterol, and fasting plasma glucose; and blood pressure. A classification of metabolic syndrome is triggered when predefined limits of any 3 of these 5 criteria are exceeded [1].
The metabolic syndrome (MS) is a combination of interrelated metabolic abnormalities that significantly increase the risk of cardiovascular disease, and type 2 diabetes mellitus (DM2). Its prevalence is increasing worldwide and is a serious public health problem [2]. Each component of MS is individually associated with an increased risk of cardiovascular disease; however, whether MS leads to greater cardiovascular risk than the sum of its components remains a matter of debate.

It has been suggested that the number of MS components may be more useful in predicting cardiovascular disease than MS itself, since cardiovascular risk increases as the number of components increases [3]. Similarly, given the heterogeneity of MS, the impact of the possible combinations of its components on predicting cardiovascular risk has been investigated. In this sense, DM2 is the predominant risk factor associated with the development of ischemic heart disease [4].
Worldwide, the metabolic syndrome (MetS) is a major health problem associated with increased morbidity and mortality from cardiovascular disease (CVD). MetS is a conglomerate of various risk factors which is known to increase the risk for development of CVD [5]. Various terms which have been ascribed for this constellation of findings are syndrome X, insulin resistance syndrome, “deadly quartet” and obesity dyslipidemia syndrome. MetS represents a group of cardiovascular risk factors, including hyperglycemia, elevated blood pressure (BP), elevated triglyceride (TG) levels, central obesity and decreased high-density lipoprotein cholesterol (HDL-C). It will exacerbate the progression of CVD if left untreated [6].

Objectives

The main objective of the study is to analyse the metabolic syndrome in patients of acute coronary syndrome.

MATERIAL AND METHODS:

This cross-sectional study was conducted in SIMS, Lahore during June 2019 to December 2019. Clinical histories from inpatients with ACS admitted to coronary or intensive care units in hospital were selected for this study. Demographic and clinical data were obtained from the clinical histories: age, sex, weight, height, previous atherosclerotic vascular disease (defined as previous coronary disease, stroke, or peripheral arterial disease), hypertension, DM2, a sedentary lifestyle (defined as performing less than 30min of moderate exercise 3 days per week), smoking, alcohol consumption, and previous lipid-lowering treatment. Individuals were classified as being non-smokers, current smokers, and former smokers (patients who had quit smoking at least 3 months before admission). Fasting plasma glucose levels and lipid profile were measured.

Quantitative variables are expressed as mean±standard deviation, and qualitative variables as absolute and relative frequencies. Normally distributed data were analyzed using the Student *t*-test to compare means; otherwise the Mann-Whitney U test was used.

RESULTS:

The total prevalence of MS using ATPIII criteria was 50.9% (292 patients). We found no MS components in 29 patients (5.1%), 1 in 96 (16.7%), 2 in 157 (27.4%), 3 in 135 (23.5%), 4 in 115 (20%), and all 5 in 42 (7.3%) patients. The most frequent component of MS was carbohydrate metabolism disorder, followed by reduced HDLc levels, hypertension, hyper triglyceridemia and, in last place, obesity.

In total, 85.3% had carbohydrate metabolism disorder and the same percentage had low HDLc levels; 80.5% had hypertension, 65.4% had hypertriglyceridemia, and 51.7% had a BMI above the established cut off point.

Table 01. Characteristics of the Patients with Acute Coronary Syndrome

	Without MS (n=282)	With MS (n=292)	P
Women, % (n)	12.8 (36)	24.3 (71)	**<.001**
Age (years)	62.3±12.7	62.4±11.1	.891
Previous atherosclerotic vascular disease, % (n)	39.9 (110)	47.7 (135)	.062
Current smokers, % (n)	42.1 (115)	41 (119)	.928
Former smokers, % (n)	34.1 (93)	33.8 (98)	
Sedentary lifestyle, % (n)	61.7 (127)	72 (175)	**.021**
Alcohol consumers, % (n)			
15-30 g/day	13 (25)	12.5 (28)	.089
>30 g/day	8.8 (17)	10.3 (23)	
BMI (kg/m2)	26.8±3.5	30±4.2	**<.001**
BMI <25, % (n)	27.3 (77)	12.7 (37)	**<.001**
BMI 25-30, % (n)	61.7 (174)	36.6 (107)	
BMI >30, % (n)	11 (31)	50.7 (148)	
DM2, % (n)	18.4 (51)	50.2 (140)	**<.001**
Fasting plasma glucose (mg/dL)	115.9±51.5	144.7±66.8	**<.001**
Total cholesterol (mg/dL)	185.2±44.7	189±47.7	.292
LDLc (mg/dL)	117±40.8	124±42.4	.054
HDLc (mg/dL)	45±12.7	36.2±8.9	**<.001**
Non-HDLc (mg/dL)	140.1±43.9	153.2±46.2	**.001**
Triglycerides (mg/dL)	119.5±62.8	184.1±94.7	**<.001**
Low HDLc+hypertriglyceridemia, % (n)	6.4 (18)	55.5 (162)	**<.001**
Components of MS			
Carbohydrate metabolism disorder, % (n)	46.5 (131)	85.3 (249)	**<.001**
Low HDLc, % (n)	34 (96)	85.3 (249)	
Hypertension, % (n)	38.2 (105)	80.5 (235)	
Hypertriglyceridemia, % (n)	16.7 (47)	65.4 (191)	
High BMI, % (n)	11 (31)	51.7 (151)	

The patients with ACS and MS had a greater prevalence of a sedentary lifestyle and increased non-HDLc levels than the patients without MS, as well as a greater prevalence of diagnostic components of MS. No differences were observed between the 2 groups by age, smoking, or alcohol consumption.

DISCUSSION:

MetS is a major public health problem of 21st century. It is the conglomerate of physical conditions and metabolic abnormalities occurring together that increases an individual risk for development of type 2 diabetes mellitus and CVD. If the trend of MetS continues to increase, the premature deaths and disabilities resulting from it will pose an increase of the financial and social burden in both developed and developing countries [7]. Numerous definitions have been proposed in the past by various expert groups for the MetS. In 1998, World Health Organization (WHO) defined MetS, according to which a person must have either glucose intolerance or insulin resistance with two of the following four criteria: central obesity, hypertension, dysplipidemia and albuminuria [8].

BMI was higher in patients who had MetS. South Asian population is found to be phenotypically distinct from Caucasians when studied in context of MetS, in form of lower BMI, waist circumference and muscle mass. South Asian adults have hyperglycemia, hypertension and hypertriglyceridemia at lower levels of BMI and waist circumference. The mechanisms by which MetS increases CVD risk remains poorly understood, but given the clear associations between the two, it probably directly influences atherosclerotic development, progression and instability [9]. There are varied propositions regarding mechanistic considerations linking MetS and atherosclerosis. The principle vascular perturbations linked to MetS include endothelial vasomotor dysfunction, vascular effects of advanced glycation end products, adverse effects of circulating free fatty acids (FFAs), and increased systemic inflammation. Endothelial vasomotor dysfunction, a hallmark of vascular disease in MetS, is associated with adverse CVD outcomes [10].

CONCLUSION:

It is concluded that women with ACS show a higher prevalence and a greater number of components of MS than men. Also there is trend of more advanced

vascular damage (depending on number of vessel and type of lesion involved) in patients with MetS than those without MetS. The most prevalent components of the MS were hyperglycemia and low HDLc concentrations, followed by hypertension.

REFERENCES:

1. Al Suwaidi J, Zubaid M, El-Menyar AA, Singh R, Rashed W, Ridha M, Shehab A. et al. Prevalence of the metabolic syndrome in patients with acute coronary syndrome in six middle eastern countries. J Clin Hypertens (Greenwich) 2010;12(11):890–899.
2. Danciu SC, Iqbal FM, Manankil FM. et al. Metabolic syndrome in younger patients with acute coronary syndrome. Eur J Gen Med. 2012;9(1):22–26.
3. Pandey S, Baral N, Majhi S, Acharya P, Karki P, Shrestha S, Das BK. et al. Prevalence of the metabolic syndrome in acute myocardial infarction and its impact on hospital outcomes. Int J Diabetes Dev Ctries. 2009;29(2):52–55.
4. Yasar AS, Bilen E, Bilge M, Arslantas U, Karakas F. Impact of metabolic syndrome on coronary patency after thrombolytic therapy for acute myocardial infarction. Coron Artery Dis. 2009;20(6):387–391.
5. Dohi T, Miyauchi K, Kasai T, Kajimoto K, Kubota N, Tamura H, Yokoyama T. et al. Impact of metabolic syndrome on 10-year clinical outcomes among patients with acute coronary syndrome. Circ J. 2009;73(8):1454–1458.
6. Gupta A, Gupta R, Sarna M, Rastogi S, Gupta VP, Kothari K. Prevalence of diabetes, impaired fasting glucose and insulin resistance syndrome in an urban Indian population. Diabetes Res Clin Pract. 2003;61(1):69–76.
7. Ramachandran A, Snehalatha C, Satyavani K, Sivasankari S, Vijay V. Metabolic syndrome in urban Asian Indian adults - a population study using modified ATP III criteria. Diabetes Res Clin Pract. 2003;60(3):199–204.
8. Prasad SB, Fahrtash F, Malaiapan Y, Meredith IT, Cameron J. Obesity and the metabolic syndrome in patients with acute myocardial infarction. Int J Cardiol. 2010;144(3):450–451.
9. Takeno M, Yasuda S, Otsuka Y, Morii I, Kawamura A, Yano K, Miyazaki S. Impact of metabolic syndrome on the long-term survival of patients with acute myocardial infarction: potential association with C-reactive protein. Circ J. 2008;72(3):415–419.
10. Zeller M, Steg PG, Ravisy J, Laurent Y, Janin-Manificat L, L'Huillier I, Beer JC. et al. Prevalence and impact of metabolic syndrome on hospital outcomes in acute myocardial infarction. Arch Intern Med. 2005;165(10):1192–1198.