ORIGINAL RESEARCH PAPER

Volume-7 | Issue-1 | January-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PREVALANCE AND CLINICAL PROFILE OF METABOLIC SYNDROME IN PATIENTS OF CORONARY ARTERY DISEASE

General Medicine

Suchitra Garhwal* Senior Resident Medicine Department, Government Medical College, Jamnagar. *Corresponding Author

Prakash V. Makwana Professor Medicine Department, Government Medical College, Jamnagar

ABSTRACT

INTRODUCTION: 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). In this study, we studied prevalence and clinical profile of MS in patients of coronary artery disease.

MATERIAL AND METHODS: This study was conducted on 150 patients with coronary artery disease, out of these 100 patients had metabolic syndrome. MS was diagnosed with International Diabetes Federation criteria.

RESULTS: Prevalence of metabolic syndrome in this study was 48.21%. DM, impaired glucose tolerance, obesity, hypertension, sedentary lifestyle and smoking are risk factors for the metabolic syndrome, and metabolic syndrome significantly increases the risk of coronary artery disease.

KEYWORDS

Metabolic syndrome; Ischemic heart disease; Prevalence

INTRODUCTION:

The metabolic syndrome (MS) is a combination of interrelated metabolic abnormalities that significantly increase the risk of cardiovascular disease, and DM2.[1] MS is affecting more and more people globally with time and emerged as serious public health problem. Components of metabolic syndrome individually increase risk of cardiovascular disease; however, whether MS by definition as per say leads to greater cardiovascular risk than the sum of its components is not clear and remains a matter of debate.[2] In many studies, it has been hypothesized that the number of MS components may be more useful in predicting cardiovascular disease than MS itself.[3] Metabolic syndrome's global prevalence varies from <10% to as much as 84%, which depend upon many factors like region, composition (sex, age, race, and ethnicity) of the population studied, urban or rural environment, and the definition of the syndrome used[4,5]. In estimation made by IDF, predicts that one-quarter of the world's adult population is suffering from metabolic syndrome[6]. Certain risk factors like sedentary lifestyle, higher socioeconomic status, and high body mass index (BMI) were significantly associated with MS. Cameron have concluded that the differences in genetic background, diet, levels of physical activity, smoking, family history of diabetes, and education all influence the prevalence of the metabolic syndrome and its components[7]. In this study, we studied prevalence and clinical profile of metabolic syndrome in patients of coronary artery disease.

MATERIAL AND METHODS:

This case control study was undertaken in 150 patients of ACS with more than 18 years of age admitted in the Department of Medicine of a tertiary care center. The patients were divided in two groups by simple randomization, one group of patients (50 patients) was ACS without MS (NMS) and another group (100 patients) was ACS with MS (MS). Out of 100 patients of ACS (ST elevation myocardial infarction (STEMI), NON STEMI or unstable angina), patients with MS were identified with application of IDF (international diabetes foundation) criteria and NCEO/ATP III (National cholesterol education program/adult treatment panel-III).

The criteria defined by modified NCEP-ATP III guidelines: 1) waist circumference (≥ 90 cm in men and ≥ 80 cm in women); 2) SBP ≥ 130 mm Hg and/or DBP ≥ 85 mm Hg or medical treatment of previously diagnosed hypertension; 3) triglyceride (TG) > 150 mg/dL (1.7 mmol/L); 4) HDL-C < 40 mg/dL (1.03 mmol/L) in men, < 50 mg/dL (1.29 mmol/L) in women; 5) fasting glucose > 110 mg/ dL. Presence of any three or more defined MetS.[8]

After a person labeled as ACS and MS, a thorough history taking and clinical examination was performed. Serum electrolyte, renal, liver and lipid profile, fasting and postprandial blood sugars were measured according to standard protocol.

Statistical Analysis was performed by using chi Square test and student t test was applied to see the difference in mean values of a quantitative data.

RESULTS:

This study was conducted on 150 patients of acute coronary syndrome, out of which 100 patients were included in metabolic syndrome group.

TABLE 1: Demographic and baseline characteristic

TABLE 1A: Demographic characteristic of patients

		IHD with MS	IHD without MS
Sex	Male	60	38
	Female	40	12
Age (years)	<51	30	18
	51-60	39	15
	>60	31	17

TABLE 1B: Risk factors

Risk factor		IHD with MS	IHD without MS	Statistical analysis IHD with MS v/s IHD alone group	
				p	s
Past history	Hypertension	40	11	0.04	S
	IHD	30	21	0.20	NS
	DM	67	3	<0.0001	HS
	CVA	18	5	0.29	NS
Sedentary lifestyle		60	20	0.032	S
Smoking		61	11	<0.0001	HS
Tobacco chewing		34	10	0.11	NS
Alcohol intake		4	0	0.37	NS

All components of MS like waist circumference, blood pressure, triglyceride, low HDL, fasting blood sugar were significantly high (p <0.05) in MS group than ACS alone group (Table 2).

TABLE 2: Comparison of various components of metabolic syndrome

Group (Mean±SD)	IHD with MS N= 100	IHD alone N= 50	Statistical analysis IHD with MS v/s IHD alone group	
			p	s
BMI (Kg/m^2)	25.97±2.48	23.9±1.51	<0.0001	HS
WC (cm)	88.91±7.05	86.56±5.71	0.04	HS
SBP (mmHg)	143.28±22.45	123.04±21.52	<0.0001	HS
DBP (mmHg)	87.8±11.90	79.24±10.67	<0.001	HS
FBS (mg/dl)	162.13±45.94	97.56±16	<0.0001	HS

TC (mg/dl)	179±33.47	166.92±36.06	0.04	HS
LDL (mg/dl)	99.7±22.72	106.4±13.07	0.055	NS
HDL (mg/dl)	46.94±9.26	53.24±7.36	<0.0001	HS
TGs (mg/dl)	174.43±39.72	105.7±13.13	<0.0001	HS

Here in MS group, average BMI was higher than control group (p value <0.0001), and also had higher systolic and diastolic blood pressure compare to control group (p value for SBP and DBP is <0.0001 and <0.001 respectively).

Patients with metabolic syndrome (85%) had higher mean fasting blood sugar value in compare to control group (6%) with p value <0.0001.

In this study metabolic syndrome group had higher total cholesterol (p value of 0.04), lower HDL value (p value of <0.0001), high TG value (p value <0.0001). ST elevation myocardial infarction was seen in 56% patients with MS and 60% patients in control group.

All five components of MS were present in 10% patients, while presence of 3 and 4 components of MS were seen in 43% and 47% patients respectively.

DISCUSSION:

Over the time, many studies have been carried out to detect prevalence and clinical profile of metabolic syndrome in western countries, but data from Indian studies is scarce, and moreover, Asian Indian study outside the India outnumber the study from India[9].

Prevalence of MS in this study was 48.21%, which is similar to study done by Anand Verma[10] and Ana Jover[1], where prevalence of MS was 49% and 50.9% respectively. The mean age in this study was 56.19 years (age range= 36-75 years), and highest number of patients was in between 51 to 60 years of age. Similar age distribution was found in study done by Dhakda[11].

In this study, 60% of patients having metabolic syndrome had sedentary life style as compared to control group (40%). Similar results were found in the studies by Gupta[12] and Shah[13]. Similarly, smoking was a significant risk factor for metabolic syndrome. Similar findings were observed by Nadri[14].

Patients, who had past history of DM and hypertension, were at higher risk for MS. In one study, it was demonstrated that presence of MS in diabetic patients had increased risk of cardiovascular events by tenfold[15].

Individual components of MS may work synergistically to increase risk of cardiovascular disease. So, study of individual component is important. BMI was significantly high in MS group compare to ACS alone group and similar results were found in other studies[16]. Regarding hypertension, in MS group, both mean systolic and diastolic blood pressure were significantly high compare to control group. 72% of patients in metabolic syndrome had hypertension, compare to control group (10%), with a p value of <0.0001. Similar result was found in a study done by Mohammad Ali Sowdagar[17].

Patients with MS had higher mean fasting blood sugar compare to control group and similar findings have been observed by Nadri[14]. Metabolic group had higher total cholesterol and triglyceride level and low HDL compare to control group, and similar findings were observed in other studies[17,18].

Presence of MS increases risk of cardiovascular disease, but not above and beyond the risk associated with its individual components. So, the number of markers is more important than metabolic syndrome by definition per se. Each component of metabolic syndrome increases risk of cardiovascular disease independently[19]. In our study, all components of metabolic syndrome were present in 10% patients, while 4 components and 3 components were present in 47% and 43% patients respectively.

Our study has some limitations, as it is a single centre study with small sample size. So, it is difficult to generalize result on all Indian population.

From this study we conclude that diabetes mellitus, impaired glucose tolerance, obesity, hypertension, sedentary lifestyle and smoking are risk factors for the metabolic syndrome, and metabolic syndrome significantly increases the risk of coronary artery disease. Modification of lifestyle may prevent development of metabolic syndrome.

REFERENCES

1. Ana Jover, Emili Corbella et al. Prevalence of Metabolic Syndrome and its Components in Patients With Acute Coronary Syndrome. Rev Esp Cardiol. 2011; 64(7):579–586.
2. Mente A, Yusuf S et al. Metabolic syndrome and risk of acute myocardial infarction. J Am Coll Cardiol. 2010;55:2390–8.
3. Solymoss BC, Bourassa MG et al. Effect of increasing metabolic syndrome score on atherosclerotic risk profile and coronary artery disease angiographic severity. Am J Cardiol. 2004;93:159–64.
4. S Desroches, B Lamarche. The evolving definitions and increasing prevalence of the metabolic syndrome. Applied Physiology, Nutrition and Metabolism. 2007: 32(1): 23–32.
5. GD Kolovou, KK Anagnostopoulou et al. The prevalence of metabolic syndrome in various populations. The American Journal of the Medical Sciences. 2007: 333(6): 362–371.
6. International Diabetes Federation: The IDF consensus worldwide definition of the metabolic syndrome, http://www.idf.org/metabolic-syndrome.
7. AJ Cameron, JE Shaw, PZ Zimmet. The metabolic syndrome: prevalence in worldwide populations. Endocrinology and Metabolism Clinics of North America. 2004: 33(2): 351–375.
8. Heng D, Ma S, Lee JJ et al. Modification of the NCEP ATP III definitions of the metabolic syndrome for use in Asians identifies individuals at risk of ischemic heart disease. Atherosclerosis. 2006; 186(2):367-373.
9. Shashank R Joshi. Metabolic Syndrome - Emerging cluster of Indian phenotype. Editorial JAPI. 2003: 51: 445 -446.
10. Anand Verma, Abhishek Agarwal et al. Association between Metabolic Syndrome and Acute Coronary Syndrome in Central India. Sch. Acad. J. Biosci., 2016; 4(3A):218-223.
11. Virendra Dhakhada, Madhu Panjwani, Ajay Dabhi. Study of Association Between Metabolic Syndrome and Acute Coronary Syndrome. Indian Journal of Clinical Practice. 2013; Vol 24 (4): 324-7.
12. R.Gupta, VP Gupta, M Serna, H Prakash, Shweta Rastogi. Serial epidemiological surveys in urban Indian population demonstrate increasing coronary risk factor among the lower socioeconomic strata. JAPI. 2003:51:470 -7.
13. Pankaj Shah. Metabolic syndrome. Mechanism and measurement of insulin resistance. Metabolic syndrome proceeding of the VIIth Annual Ranbaxy science foundation symposium. Dec 23 -2003.
14. FR Nadri, B Issac, AR Shenoy, K Verghees, SS lyenger. A study of prevalence of metabolic syndrome in patients with Ischaemic heart disease in south India. Indian Heart Journal. 2003: 54 Sept-Oct 2003.
15. Bonora E, Targher G et al. The Metabolic Syndrome is an independent predictor of cardiovascular disease in Type 2 diabetic subjects. Prospective data from the Verona Diabetes Complications Study. Diabet Med 2004;21:52-8.
16. Santosh Kumar Sinhaa, Amit Goela et al. Prevalence of Metabolic Syndrome and Its Clinical and Angiographic Profile in Patients With Naive Acute Coronary Syndrome in North Indian Population. J Clin Med Res. 2016;8(9):667-673.
17. Mohammad Ali Sowdagar, AN Otikunta et al. A Study of the Cardiovascular Risk Factor Profile in Patients with Acute Coronary Syndrome with Particular Reference to Metabolic Syndrome. International Journal of Clinical Medicine. 2015: 6: 859-866.
18. Ajay Rajbhandari, Dipendra Raj Pandeya et al. Prevalence of Metabolic Syndrome and its Component in Patients with Acute Coronary Syndrome. MJSBH. July-December 2013: Vol 12: Issue 2.
19. Kim JY, Mun HS, Lee BK et al. Impact of metabolic syndrome and its individual components on the presence and severity of angiographic coronary artery disease. Yonsei Med J 2010; 51: 676-82.