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Research Article

A STUDY OF METABOLIC SYNDROME IN THE RURAL POPULATION OF HARYANA.

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ABSTRACT

Metabolic Syndrome (MS) is the clustering of risk factors for cardiovascular disease. It is estimated that the burden due to cardiovascular disease (CVD) will markedly increase in developing countries particularly in the Indian subcontinent. Because both under nutrition and over nutrition are seen simultaneously in developing countries, the double burden of diseases makes the situation more difficult. The study included 100 subjects of the age group 20 -60 yrs attending the OPD of MMIMSR. The cross-sectional study was done for a period of 3 months from the month of January 2011 to April 2011. Simple Random sampling methods was adopted for the selection of subjects. According to NCEP definition, maximum overall percentage of MS was 20.5% and gender specific for males and females was 30.1% and 26.7% respectively. Prevalence of obesity and the metabolic syndrome has shown a rapid rise in developing countries in the past few decades and has led to increased risk of CVD and consequent morbidity and mortality.

KEY WORDS: Metabolic Syndrome, NCEP ATP III, Rural Population, Cardiovascular disease

INTRODUCTION

The metabolic syndrome is a group of risk factors of metabolic origin that are accompanied by increased risk for type 2 diabetes mellitus and cardiovascular disease. These risk factors include atherogenic dyslipidemia, elevated blood pressure and plasma glucose, and a prothrombotic and proinflammatory state. The condition is progressive and is exacerbated by physical inactivity, advancing age, hormonal imbalance, and genetic predisposition. The metabolic syndrome is a particularly challenging clinical condition because its complex molecular basis is still largely undefined.[1]

In 1988, Reaven postulated that insulin resistance (IR) was the cause of glucose intolerance, hyperinsulinaemia, increased very-low-density lipoprotein (VLDL), decreased high-density lipoprotein (HDL) and hypertension.[2] Twenty years later; the insulin resistance syndrome has graduated to become the metabolic syndrome (MetS). MetS is thought to represent a combination of cardiovascular risk determinants, including obesity (especially central adiposity), glucose intolerance and IR, dyslipidaemia (including hypertriglyceridaemia, increased free fatty acids (FFAs) and decreased HDL-cholesterol) and hypertension, and more recently has also been associated with clinical manifestations such as polycystic ovarian syndrome(PCOS), atherosclerosis, pro inflammatory state, oxidative stress and non-alcoholic fatty liver disease (NAFLD).

As a multicomponent condition, MetS imparts an approximate doubling of risk for atherosclerotic cardiovascular disease.[3] However; it is currently uncertain

which component of the syndrome configures this risk. In fact, there is currently a controversial debate surrounding the identity of MetS and its pedagogic utility and diagnostic capacity.[4, 5]

In 2001, the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III [ATP III]) suggested a clinical definition for the metabolic syndrome that includes blood pressure, waist circumference, high-density lipoprotein (HDL) cholesterol, and triglyceride

and fasting plasma glucose levels.[6]A recent study has examined the relation of insulin sensitivity and intraabdominal adipose tissue and subcutaneous fat areas with the NCEP ATP III criteria for the metabolic syndrome in a nondiabetic population.[7] The metabolic syndrome was defined according to the NCEP ATP III as the presence of 3 or more of the following clinical criteria [6]:

Blood pressure of ≥130/85 mm Hg;

Waist circumference of >102 cm in men and >88 cm in women;

HDL cholesterol of<1.036 mmol/L (40 mg/dL) in men and <1.295 mmol/L (50 mg/dL) in women;

Triacylglycerol of ≥1.695 mmol/L (150 mg/dL); and

Fasting plasma glucose levels ≥6.1 mmol/L (110 mg/dL).

MATERIALS AND METHOD

The study population included 100 subjects from rural population of Haryana attending the outpatient department of Maharishi Markandeshwar Institute of Medical Sciences and Research, MMU, Mullana, Ambala. A hospital based cross sectional study was conducted from the month of January 2011 to April 2011. Simple Random sampling methods was adopted for the selection of subjects. Informed written consent of the subjects was taken for the study. We used NCEP ATP III definition for the detection of Metabolic Syndrome Total numbers of subjects were 100 and subjects more than 20 years and less than 60 years were included. The exclusion criteria was individuals below 20 years and above 60 years , pregnant women, other endocrine disorders like hypothyroidism, Cushing's syndrome and patients on steroid therapy.

OBSERVATIONS/RESULTS

Table 1&Figure 1 shows the percentage and frequency of subjects who had MetS which came out to be 20.5% (36 frequency) out of 100 subjects.

Table 2&Figure 3 shows the gender wise distribution of MetS. Males had 30.1% and females had 26.7% prevalence of MetS.

Table 3and Figure 3 shows the age wise distribution of MetS. 40% prevalence of MetS was seen between the age group of 20-34 years. Again 40% of subjects had MetS between the age group of 35-49 years. 13% had MetS between the age group of 50-59 years and 7% subjects had prevalence in the 60 years of age group.

Table 4shows distribution of different parameters in MetS subjects which includes Demographic profile (Gender and Age), Biochemical Profile (FPG, HDL and Triglycerides) and Clinical Profile (Waist Circumference and Blood Pressure). In demographic profile, it was seen that males outnumbered females in the prevalence of MetS. Also, maximum prevalence was seen between the age group of 35-49 years. In biochemical profile, different components were Fasting Plasma Glucose, HDL and Triglycerides. 29 subjects showed raised FPG (>110 mg/dl), 35 subjects had low HDL levels (<50 mg/dl) and 20 subjects had raised Triglyceride levels (>150 mg/dl). In clinical profile, 15 subjects had waist circumference between 30-36 inches and 12 subjects had blood pressure within the Prehypertensive Stage (120-139/or80-89 mmHg). Only 3 subjects were in Stage 1 hypertensive stage (140-159/or90-99 mmHg).

DISCUSSION

Metabolic Syndrome refers to clustering or constellation of cardiovascular disease risk factors. The risk factors include elevated blood pressure, dyslipidemia (hypertriglyceridemia, low levels of high density lipoprotein (HDL) Cholesterol), hyperglycemia, and central obesity.[8] The dominant underlying risk factors appear to be abdominal obesity and insulin resistance.[1] The metabolic syndrome is one of the major public health issues of our time.[9] Asian Indians are, at risk population, with respect to diabetes and cardiovascular disease, and the numbers are consistently on the rise.[10]

Present study was conducted in 100 subjects attending the outpatient department of Maharishi Markandeshwar Institute of Medical Sciences & Research, Mullana, Ambala to assess the MetS on the basis on the definition given by NCEP-ATP III.

In our study the subjects were between the age group of 20-60 years and it was found that prevalence of MetS came out to be 20.5% out of 100 subjects (table and figure 1). It was also seen that males (30.1%) had more prevalence than females (26.7%) (table and figure 2). In age wise distribution maximum prevalence was seen in age groups 20-34 years and 35-49 years (i.e. 40% & 40%), respectively (table and figure 3).

Association of MetS was not found significant with gender and triglyceride levels (p>0.0001) but association of MetS was highly significant with age, FPG, HDL, waist circumference and blood pressure (p= 0.0001)

Table 1: Metabolic Syndrome

MetS	Frequency	Percent
Present	36	20.5
Absent	64	36.4
Total	100	56.8

Table 2: Gender wise distribution

Gender	Frequency	Percent
Male	53	30.1
Female	47	26.7
Total	100	56.8

Table 3: Age wise distribution

Age (in years)	Frequency	Percent
20-34	40	40.0
35-49	40	40.0
50-59	13	13.0
60	7	7.0
Total	100	100.0

Table 4: Different Parameters distribution in Metabolic Syndrome subjects

Components			**Metabolic Syndrome**	
			Present	Absent
A. Demographic Profile	Gender	Male	19	34
		Female	17	30
	Age	20-34	4	36
		35-49	21	19

		50-59	8	5
		60	3	4
B. Biochemical Profile	FPG (mg/dl)	50-70	1	7
		70-90	3	30
		90-110	3	20
		>110	29	7
	HDL (mg/dl)	20-30	11	1
		30-40	11	15
		40-50	13	18
		50-60	0	23
		>60	1	7
	Triglycerides (mg/dl)	<75	5	11
		75-100	4	8
		100-125	4	11
		125-150	3	11
		150-175	1	4
		>175	19	19
C. Clinical Profile	Waist Circumference (inch)	24-30	0	14
		30-36	15	44
		36-40	12	4
		>40	9	2
	Blood Pressure (mm Hg)	<120/&80	0	13
		120-129/or80-84	20	48
		130-139/or85-89	13	3

		140-159/or90-99	3	0
		≥160/≥100	0	0

Figure 1: Metabolic Syndrome

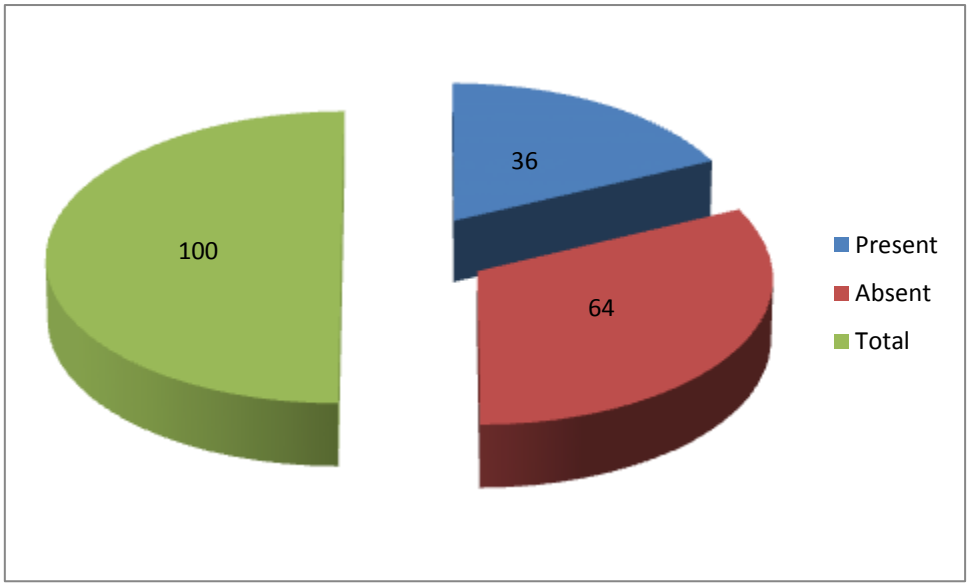


Figure 2: Gender wise distribution

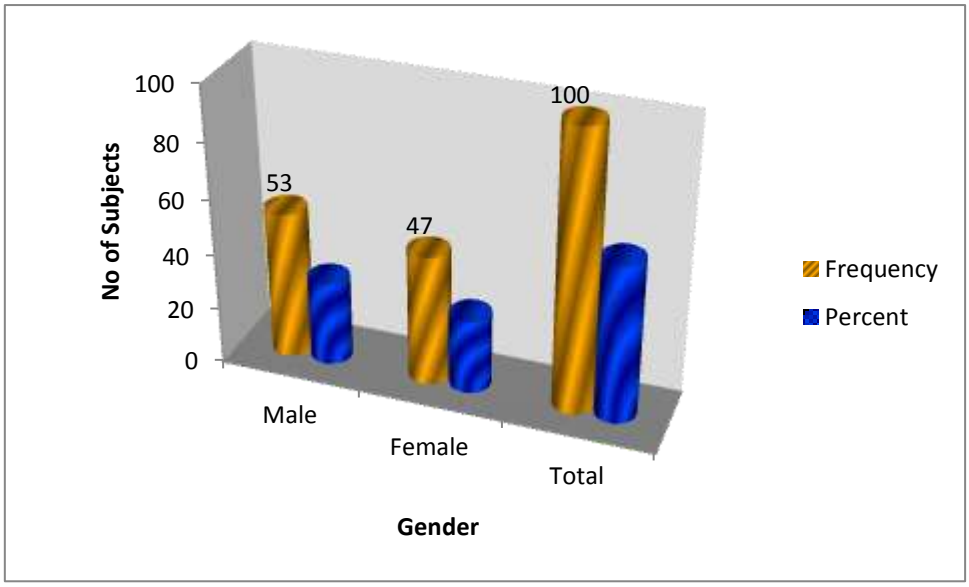
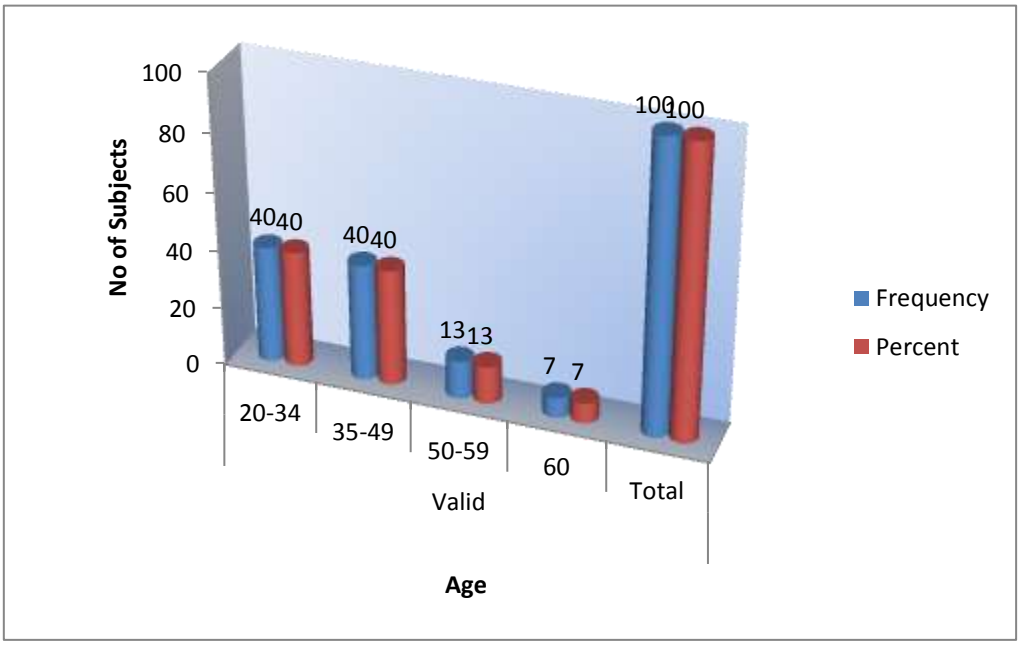


Figure 3: Age wise distribution



CONCLUSION

In conclusion, it was seen that prevalence of Metabolic syndrome was low in rural population of Haryana but it could be a serious problem in the future. Awareness about healthy nutrition and lifestyle should be imparted. It is important for the both international and national government agencies and the medical fraternity to report this issue and prevent the consequences also minimizing its prevalence in the developing countries.

REFERENCES

[1] Nisoli E, Clementi E, Caruba MO and Moncada S: Defective Mitochondrial Biogenesis: A Hallmark of the High Cardiovascular Risk in the Metabolic Syndrome? Circ Res 2007, 100(6):795-806.

[2] Reaven GM. Banting Lecture 1988: Role of insulin resistance in human disease. Diabetes 1988, 37(12):1595-607.

[3] Grundy SM: Metabolic Syndrome: therapeutic considerations. Handb Exp Pharmacol 2005, (170):107-33.

[4] Ferrannini E: Metabolic Syndrome: a solution in search of a problem. J Clin Endocrinol Metab 2007, 92(2):396-8.

[5] Reaven GM: The Metabolic Syndrome: is this diagnosis necessary? Am J Clin Nutr 2006, 83:1237-47.

[6] Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults. Executive Summary of the third report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). JAMA 2001, 285(19):2486-497.

[7] Carr DB, Utzschneider KM, Hull RL, Kodama K, Retzlaff BM, Brunzell JD, et al: Intra-abdominal fat is a major determinant of the National Cholesterol Education Program Adult Treatment Panel III criteria for the metabolic syndrome. Diabetes 2004, 53:2087–94.

[8] Akintunde AA, Ayodele OE, Akinwusi PO, and Opadijo GO:Metabolic Syndrome: Comparison of Occurrence Using Three Definitions in Hypertensive Patients.Clin Med Res 2011, 9(1):26-31.

[9] Zimmet P, Alberti G, Shaw J: A new IDF worldwide definition of the metabolic syndrome : the rationale & the results. Rev Esp Cardiol 2005, 58:1371-5.

[10] Misra A & Khurana L: The Metabolic Syndrome in South Asians: epidemiology, clinical correlates & possible solutions. International Diabetes Monitor 2009, 21(3):92-101.