Study on Frequency of Metabolic Syndrome Between Literate and Illiterate in Rural Area of Varanasi

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ABSTRACT *The metabolic syndrome (MS) is characterized by the simultaneous occurrence of several metabolic and non-metabolic abnormalities that result in a marked increase in cardiovascular morbidity and mortality. The study subjects were examined and their laboratory investigations were carried out in a fasting state. Our study was conducted to assess the prevalence of metabolic syndrome in rural area population of Varanasi and to determine the role of higher education played in decreasing the frequency of metabolic syndrome.*

Introduction:

The metabolic syndrome (MS) is characterized by the simultaneous occurrence of several metabolic and non-metabolic abnormalities that result in a marked increase in cardiovascular morbidity and mortality. The rapid rise of non communicable diseases (NCDs) is presenting a formidable challenge in 20th century which is threatening economic and social development of the world as well as the lives and health of millions across the globe. As many countries are struggling to control infectious diseases, they are facing an explosion in chronic diseases; a situation for which they have neither the resources, personnel nor the health service infrastructure required to respond effectively.[1] Of the 57 million deaths that occurred globally in 2008, 36 million; almost two thirds were due to NCDs, comprising mainly cardiovascular diseases, cancers, diabetes and chronic lung diseases.[2] Especially in developing countries, the burden of chronic diseases is increasing rapidly and will have significant social, economic and health consequences.[3] India is also undergoing rapid urbanization with increased industrialization, rising incomes, expanded education and improved health care.[4] There is increased consumption of tobacco, an unhealthy diet, physical inactivity and adoption of other unhealthy lifestyles leading to rise in prevalence of non communicable diseases. Modern medical care is now enabling many with chronic diseases to survive. The impact of chronic diseases on the lives of people is serious when measured in terms of loss of life, disablement, family hardship, poverty and economic loss to the country.[5]

The metabolic syndrome is characterized by clustering of risk factors, which predisposes subjects to increased risk of diabetes and cardiovascular disease (CVD).[6,7] The main components of the syndrome are glucose intolerance, obesity, raised blood pressure and dyslipidemia. It is increasingly attracting the attention of international research institutions and scientific societies, as a major modifiable determinant of cardiovascular disease and type 2 diabetes.[8-10] Hypertension is a highly prevalent condition, which presents a significant global challenge. In 2000, approximately one billion people worldwide (26.4% of the adult population) were estimated to have hypertension and this is likely to increase to over 1.5 billion by 2025 as a result of the aging population in many developed countries and increasing incidence of hypertension in developing coun-

tries.[11] The criteria employed in this study are the one given by International Diabetes Federation.[12] Apart from its association with cardiovascular disorder and diabetes mellitus, metabolic syndrome is also associated with various other morbidities. Risk for several cancers increases in subjects affected by Metabolic Syndrome.[13] Several studies have found that there is a significant association of metabolic syndrome with pancreatic, colorectal, prostatic and breast cancer.[14,15] In recently years, lot of work is being done on metabolic syndrome but most of the studies have been confined to hospitals and very few studies have been conducted at community level. Therefore this study was conducted to assess the prevalence of metabolic syndrome in rural area population of Varanasi and to determine the role of higher education played in decreasing the frequency of metabolic syndrome.

Material and Methods:

The present study was conducted in Heritage Institute of Medical Sciences, Varanasi, India. The study protocol was approved by the Ethics committee of Heritage Institute of Medical Sciences. A total of 125 subjects attending the medicine outdoor patients department (OPD) and Camp organsed by Heritage Institute of Medical Sciences, Varanasi during the period from 15 June 2015 to 15 Nov 2015 was studied for following parameters. The study subjects were examined and their laboratory investigations were carried out in a fasting state.

Four diagnostic criteria other than elevated blood pressure listed in the modified ATP III version of the metabolic syndrome were examined in each patient,[16] and the presence of any two or more of these factors was considered sufficient for diagnosis. These four criteria were

Abdominal girth > 90 cm in male and > 80 cm in female.

High-density lipoprotein cholesterol (HDL-C)

i. < 40 mg/dl in male and
ii. < 50 mg/dl in female.
Fasting triglycerides ≥ 150 mg/dl and Fasting plasma glucose ≥ 110 mg/dl or use of hypoglycemic agents.

The metabolic syndrome score was defined as the number of the traits (the four above-mentioned diagnostic criteria

and elevated blood pressure) that patients had. In patients treated with lipid-lowering medications, blood samples were obtained after discontinuation of lipid-lowering medications for at least two months, whereas antihypertensive medications were continued. Serum levels of total cholesterol, total triglycerides, low-density lipoprotein cholesterol and high density lipoprotein cholesterol were assayed by routine laboratory techniques using the methods of the lipid Research Clinics, as reported previously.[17] If serum triglycerides were >400mg/dl, low-density lipoprotein cholesterol was assessed by a direct method.[17] Data were analyzed by using SPSS17.0 (SPSS Inc, Chicago, IL).

Result and Discussion:
In this study, a total 125 of subjects out of 47 were found to be having Metabolic Syndrome as per the criteria laid down by International Diabetes Federation (IDF). On studying association of metabolic syndrome with sex, it was found to be more prevalent in females 26(20.8%) than males 21(16.8%) (Table 1) This association was statistically significant (p<0.001).

Maximum numbers of metabolic syndrome cases were found in the age group of > 60 years i.e. 17(36.2%), while minimum in the age group of 21-30 i.e. 2(4.25%) (Table 2).

Table no 1: Comparison of Metabolic Syndrome according to Sex:

Sex	MS Absent n(%)	MS Present n(%)	Total n(%)
Male	40 (32%)	21 (16.8%)	61 (48.8%)
Female	38 (30.4%)	26 (20.8%)	64 (51.2%)
Total	78 (62.4%)	47 (37.6%)	125(100%)

(Statistically significant P <0.001)

Table no 2: Comparison of Metabolic Syndrome according to Age:

Age	MS Absent n(%)	MS Present n(%)	Total n(%)
21-30	30(38.5%)	2(4.25%)	32(25.6%)
31-40	20(25.6%)	6(12.8%)	26(20.8%)
41-50	12(15.4%)	9(19.1%)	21(16.8%)
51-60	10(4.25%)	13(27.65%)	23(18.4%)
>60	6(7.7%)	17(36.2%)	2318.4%)
Total	78(62.4%)	47(37.6%)	125(100%)

(Statistically significant P <0.001)

Table no 3: Comparison of Metabolic Syndrome according to Education:

Education	MS Absent n(%)	MS Present n(%)	Total n(%)
Illiterate	3(3.8%)	20(42.55%)	23(18.4%)
Primary	7(9.0%)	16(34.04%)	23(18.4%)
Secondary	18(23.07%)	8(17.02%)	26(20.8%)
Graduation	22(28.20%)	2(4.25%)	24(19.2%)
Post graduation	28(35.9%)	1(2.12%)	29(23.2%)
	78(62.4%)	47(37.6%)	125(100%)

(Statistically significant P <0.001)

MS was found to be maximum in 20 (42.55%) participants who had no education (illiterate) while minimum number of metabolic syndrome was found in post-graduation participants 1(2.12%) (Table 3). Level of education was found to be significantly associated with prevalence of metabolic syndrome (p=0.001).

Out of the total 125 participants, 47 were found to be having metabolic syndrome. In India several studies have shown different rates of prevalence in

different parts of the country[18]   found the prevalence of MS in south Indian population to be 25.8% by IDF as compared to 18.3% by ATP III. Another study from Bangalore [19] concluded that prevalence of MS (by ATP-III) was 40.3% as compared to 34.9% by IDF definition. The prevalence in Bhatia community in Rajasthan by ATP-III definition was 36.2% in males and 47.8% in females.[20] The ICMR task force[21] collaborative study reported the prevalence of metabolic syndrome to be 30 per cent in urban areas of Delhi and 11 per cent in rural Haryana using ATP-3 criteria. Similar results were found in another study conducted[22] in rural area of district Wardha, Maharashtra. It was found that overall prevalence of metabolic syndrome was 9.3 %. Higher prevalence of MS was found[23-25], who reported prevalence of MS to be 47.5%, 29.7%, and 41.3% respectively. [26,27]

In the present study, maximum 36.2% number of metabolic syndrome cases was found in the age group of 60 years and above ; and minimum 4.25% in the age group of 21-30 years. An overall increasing trend was observed in prevalence rates with increase in the age. This finding was in concordance with the study conducted[19] in Bangalore (India) and in African-American population who found that maximum prevalence was seen in 65-74 year age group and lowest was seen among 21-34 year age group.[28] Metabolic syndrome was found to be comparatively higher among females as compared to males. Same results were seen in the study conducted[20,29-32] who found a higher prevalence of Metabolic Syndrome among females as compared to males. In the present study, metabolic syndrome was found to be maximum (42.55%) in participants who had no studied illiterate while minimum (2.12%) number of metabolic syndrome cases were found in post-graduation participants.

Conclusion:
Our findings suggest that the Female gender, advancing age, illiteracy were found to contribute to Metabolic Syndrome. On the contrary, higher education played an important role in decreasing the frequency of metabolic syndrome. Therefore, early identification of the metabolic abnormalities and taking appropriate intervention by instituting holistic, multidisciplinary, and multi-sect oral preventive measures at an individual, community, and societal level would help to promote healthy dietary habits and physically active lifestyles that may fight against the growing epidemic of Metabolic Syndrome.

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