Original Article

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A Prospective Comparative Study on Metabolic Syndrome Among Urban and Rural Women Population- A Cross Sectional Study

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Abstract

Background: Metabolic syndrome is a combination of individual risk factors that are associated with several serious health conditions such as diabetes, cardiovascular disease or stroke. The present study was conducted to assess metabolic syndrome among urban and rural women population. **Subjects and Methods:** 128 females diagnosed with metabolic syndrome were included. Smoking, drug history, past history, family history etc. was taken. Weight, height, BMI, waist circumference, hip circumference, waist to hip ratio, systolic and diastolic blood pressure was also recorded. **Results:** Age group 20-35 years comprised of 24, 35-50 years had 36 and >50 years had 68 patients. The socio- economic status was middle in 70 and upper in 58, education was primary in 45 and high in 73, occupation was unemployed in 80 and employed in 48. Smoking was seen in 52 (40.6%), hypertension in 78 (60.9%), Hypertriglyceride in 84 (65.6%), alcoholics in 40 (31.2%), increased FBS in 102 (79.6%) and low HDL in 80 (62.5%). **Conclusion:** Maximum women with MS was seen in age group >50 years. Smoking, hypertension, hypertriglyceride, alcoholism, increased FBS and low HDL was seen in all patients.

Keywords: Metabolic syndrome, Smoking, Hypertension

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Introduction

Metabolic syndrome is a combination of individual risk factors that are associated with several serious health conditions such as diabetes, cardiovascular disease or stroke. It is diagnosed by the presence of three or more of five risk factors: abdominal obesity, raised blood pressure (BP), raised fasting blood glucose, raised triglycerides and reduced high-density lipoprotein (HDL) cholesterol.[1]

Metabolic syndrome (MS) is described as a cluster of abnormalities that confers an increased risk of developing atherosclerotic cardiovascular diseases (CVD) and also type 2 diabetes mellitus (T2DM).[2] In fact, MS is now considered as a global epidemic, with current estimates about 20-30% of the adult population worldwide is affected. Of interest to the current study is the fact that the prevalence of these disorders (MS and CVD) among South Asians, a community that represents one-fifth of the global population, is on the rise. This development imposes a significant health burden to the subcontinent that has limited resources. The exact cause of this health trend is currently not clear.[3]

The prevalence of MetS varies depending on the definition applied, the ethnicity, and the age of the study population. The age-adjusted prevalence among adults population was estimated to be 24%–25% in the United States, was approximately 23% in European countries and estimated to be 20%–25% among South Asians.[4] The prevalence in Asia has increased rapidly in the recent years due to rapid socioeconomic transitions to increasing affluence, urbanization, mechanization, auto-mobilization, and urban migration. However, the ethnic, cultural, environmental or economic differences contribute to varied prevalence across Asian countries.[5] The present study was conducted to assess metabolic syndrome among urban and rural women population.

Subjects and Methods

The present study comprised of 128 females diagnosed with metabolic syndrome. All were informed regarding the study and their consent was obtained.

General information such as name, age, race, socioeconomic status, occupation, smoking, drug history, past history, family

history etc. was taken. Weight, height, BMI, waist circumference, hip circumference, waist to hip ratio, systolic and diastolic blood pressure was also recorded. Results thus obtained were subjected to statistical analysis using Mann Whitney U test. P value less than 0.05 was considered significant.

Results

Table 1: istribution of patients

Age group (Years)	Number	P value
20-35 years	24	0.01
35-50 years	36	
>50 years	68	

[Table 1] shows that age group 20-35 years comprised of 24, 35-50 years had 36 and >50 years had 68 patients. The difference was significant (P< 0.05).

Table 2: 2: Demographic profile

Parameters	Variables	Number	P value
Socio-	Middle	70	0.05
	Upper	58	
Education	Primary	45	0.04
	High	73	
Occupation	Unemployed	80	0.01
	Employed	48	

[Table 2 & Figure1] shows that socio- economic status was middle in 70 and upper in 58, education was primary in 45 and high in 73, occupation was unemployed in 80 and employed in 48. The difference was significant (P< 0.05).

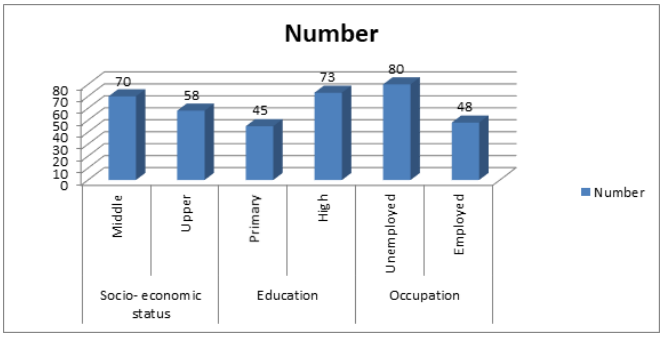

Figure 1: Demographic profile

[Table 3] shows that smoking was seen in 52 (40.6%), hypertension in 78 (60.9%), Hypertriglyceride in 84 (65.6%), alcoholics in 40 (31.2%), increased FBS in 102 (79.6%) and low HDL in 80 (62.5%).

Table 3: Determinants of metabolic syndrome

Parameters	Number	Percentage
Smoking	52	40.6
Hypertension	78	60.9
Hypertriglyceride	84	65.6
Alcoholics	40	31.2
Increased FBS	102	79.6
Low HDL	80	62.5

Discussion

Several factors are believed to be potential etiological factors in the development of MS, including increased urbanization, economic growth, irregular meal times, and lifestyle change and adoption of western diet. Unfortunately, millions of people in South Asia are facing a double health burden i.e., the impact of poverty-related diseases (associated with infections and nutrition) is being exacerbated by the increasing load of chronic non-communicable diseases.[6]

MetS is a chronic low grade inflammatory state starting from adipose tissue and further recruits immune cells which consequently releases inflammatory cytokines (TNF-α, IL-6, adiponectin, etc.) and results in an insulin-resistant state.[7] When the secretary capacity of the pancreas is overwhelmed by battling an insulin resistance state, diabetes develops. Furthermore, an increased secretion of prothrombin activator inhibitor-1 contributes to a pro-coagulant state; and along with endothelial dysfunction leads to increased risk of atherothrombosis, hypertension and CVD.[8] Estrogen production by an enlarged stromal mass predisposes the subject to the development of breast cancer. Moreover, several drugs, e.g., corticosteroids, antidepressants, antipsychotics, antihistamines can produce weight gain and predispose to MetS features: obesity and glucose intolerance. Hence, the constellation of these multiple underlying mechanisms results in MetS.[9] The present study was conducted to assess metabolic syndrome among urban and rural women population.

In present study, age group 20-35 years comprised of 24, 35-50 years had 36 and >50 years had 68 patients. Gupta et al,[10] found that there were 180 males and 300 females. 260 subjects were obese, 140 were overweight and 80 were normal. The difference was significant (P< 0.05). Low HDL was seen in 340, hypertension in 420, increased fasting blood glucose in 385 and hypertriglyceride in 365. There were 265 smokers and 270 were alcoholics.

We found that socio- economic status was middle in 70 and upper in 58, education was primary in 45 and high in 73, occupation was unemployed in 80 and employed in 48. Kaur et al,[11] assessed age, gender, social status, employment, education, family history, physical activity, dietary habits,

alcohol, sleep, body mass index and stress as determinants of MetS. The results were analyzed by Chi Square test with statistical significance of p value 50 years (86.90%; $p < 0.05$), middle socioeconomic status (70.50%), illiteracy (39.35%), and unemployment (81.97%; $p < 0.05$) were found contributing though to different extents. Subjects with a sedentary lifestyle (72.14%), positive family history (42.63%), omnivore diet (47.55%), stress (78.69%; $p < 0.05$), insomnia (29.51%) and increased BMI (83.62%; $p < 0.001$) had shown predisposition to MetS. However, the protective role of alcohol (38.28%), an active lifestyle (36.21%), vegetarian diet (62.07%) and adequate sleep (73.11%) was observed. A significant hypertension (98.37%; $p < 0.001$), dyslipidemia (77.05%; $p < 0.001$), dysglycemia (75.41%; $p < 0.001$) and obesity (59.02%; $p < 0.001$) was reported in MetS. Common concerns of female gender, increasing age and BMI, sedentary lifestyle, stress and positive family history should be considered for early identification and appropriate intervention to fight the growing MetS epidemic.

We observed that smoking was seen in 52 (40.6%), hypertension in 78 (60.9%), hypertriglyceride in 84 (65.6%), alcoholics in 40 (31.2%), increased FBS in 102 (79.6%) and low HDL in 80 (62.5%). Jesmin et al,[12] included a total of 1535 rural women aged ≥ 15 years. The prevalence of MS was estimated using NCEP ATP III, modified NCEP ATP III and IDF criteria. The prevalence rates of MS were 25.60% (NCEP ATP III), 36.68% (modified NCEP ATP III), and 19.80% (IDF), as revealed by the present study. Furthermore, based on the NCEP ATP III criteria, 11.60% of the subjects were found to have excess waist circumference; 29.12% had elevated blood pressure, 30.42% had elevated fasting plasma glucose level, 85.47% had low HDL values and 26.91% had increased triglyceride values. Low plasma HDL level was found to be the most common abnormality in the target population and elevated waist circumference was the least frequent component.

Conclusion

Authors found that maximum women with MS was seen in age group >50 years. Smoking, hypertension, hypertriglyceride, alcoholism, increased FBS and low HDL was seen in all patients.

References

1. Nilsson PM, Engström G, Hedblad B. The metabolic syndrome and incidence of cardiovascular disease in non-diabetic subjects-a population-based study comparing three different definitions. Diabet Med. 2007;24(5):464–472. Available from: https://dx.doi.org/10.1111/j.1464-5491.2007.02142.x.
2. Bonora E, Kiechl S, Willeit J, Oberhollenzer F, Egger G, Bonadonna RC, et al. Carotid Atherosclerosis and Coronary Heart Disease in the Metabolic Syndrome: Prospective data from the Bruneck Study. Diabetes Care. 2003;26(4):1251–1257. Available from: https://dx.doi.org/10.2337/diacare.26.4.1251.
3. Empana JP, Duciemetiere P, Balkau B, Jouven X. Contribution of the metabolic syndrome to sudden death risk in asymptomatic men: the Paris Prospective Study I. Eur Heart J. 2007;28(9):1149–1154. Available from: https://dx.doi.org/10.1093/eurheartj/ehm063.
4. Stern MP, Williams K, Gonzalez-Villalpando C, Hunt KJ, Haffner SM. Does the Metabolic Syndrome Improve Identification of Individuals at Risk of Type 2 Diabetes and/or Cardiovascular Disease? Diabetes Care. 2004;27:2676–2681. Available from: https://dx.doi.org/10.2337/diacare.27.11.2676.
5. Alberti KGMM, and PZZ. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus. Provisional report of a WHO Consultation. Diabet Med. 1998;15(7):539–553. Available from: https://dx.doi.org/10.1002/(sici)1096-9136(199807)15:7<539::aid-dia668>3.0.co;2-s.
6. Mohan V, Deepa M. The metabolic syndrome in developing countries. . Diabetes Voice. 2006;51:15–17.
7. Rahim MA, Hussain A, Khan AKA, Sayeed MA, Ali SMK, Vaaler S. Rising prevalence of type 2 diabetes in rural Bangladesh: A population based study. Diabetes Res Clin Pract. 2007;77(2):300–305. Available from: https://dx.doi.org/10.1016/j.diabres.2006.11.010.
8. Executive summary of the third report of the National Cholesterol Education Program (NCEP) Expert Panel: Detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III). JAMA. 2001;285:2486–2497. Available from: https://doi.org/10.1001/jama.285.19.2486.
9. Ford ES. Prevalence of the Metabolic Syndrome Defined by the International Diabetes Federation Among Adults in the U.S. Diabet Care. 2005;28(11):2745–2749. Available from: https://dx.doi.org/10.2337/diacare.28.11.2745.
10. Gupta B, Gupta R, Gupta M, Singh M. Assessment of Determinants of Metabolic Syndrome. J Adv Med Dent Scie Res. 2019;7(6):77–79.
11. Kaur J. Assessment and screening of the risk factors in metabolic syndrome. Med Sci. 2014;2:140–52. Available from: https://doi.org/10.3390/medsci2030140.
12. Jesmin S, Islam MR, Islam AMS, Mia MS, Sultana SN, Zaedi S, et al. Comprehensive assessment of metabolic syndrome among rural Bangladeshi women. BMC Public Health. 2012;12(1):1. Available from: https://dx.doi.org/10.1186/1471-2458-12-49.

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