Comparing metabolic syndrome prevalence among rural and urban women- A pilot study

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Abstract:

Background Cohort and large population studies proved the increased prevalence of metabolic syndrome in urban population but unfortunately not much survey has been done in rural side especially on women's health. Silent gradual transformation of villages is happening and this metamorphosis slowly increasing the incidence of non communicable diseases among them. Hence we decided to do a pilot study on the prevalence of metabolic Syndrome among Women, the breadwinners of rural community. **Aim** To find out the prevalence of metabolic syndrome in rural and urban women. **Materials and methods** 80 samples were collected from female participants of age group of 20-70 years.40 were from urban (madipakkam, Chennai) and 40 from rural (G.D.kandigai, Gummidipoondi) area. Women with chronic ailments were excluded. Details of the patient were obtained in the form of Questionnaire. After getting consent, anthropometry and demographic details are recorded. Fasting blood sample was collected using red top and grey top vacutainers and the following tests are processed on the same day.(Fasting Plasma Glucose, Triglycerides, High density Lipoprotein). BP was recorded. Metabolic syndrome was diagnosed using modified NCEP-ATPIII criteria. **Results** Statistical analysis performed using SPSS software version21.Prevalence was expressed as percentage (%).The overall Prevalence of metabolic syndrome including both the groups was 66.25%.It was 55% among rural and 77.5% among urban women. Individual parameters analysed in both the groups which showed increased waist circumference and decreased HDL. **Conclusion** This pilot study shows that metabolic syndrome is prevalent in rural women too though less than urban women due to lifestyle modifications and altered food habits and stressful life. Government has to create policies to curb this epidemic among rural women.

Keywords: Metabolic syndrome, prevalence, rural, urban, women

Introduction:

Metabolic syndrome is a commonly prevailed yet subtle, a disease with grievous consequences. Metabolic syndrome constitutes multiple risk factors such as central obesity, dyslipidemia, insulin resistance, hypertension which predispose to diabetes and cardiovascular diseases [1]. Central obesity is the major risk factor for metabolic syndrome [2]. People with metabolic syndrome have 30-40% risk for developing diabetes and cardiovascular diseases within 20 years of onset [3,4].

In India, the prevalence of metabolic syndrome in women ranges from 46% and it varies with age, sex and ethnicity [5]. Previous studies shows that the prevalence of metabolic syndrome is more common in women when compared to men [5,6].

Rooting of foreign customs in to our culture increased the prevalence of metabolic syndrome in our homeland. The craze for the carbonated drinks and noodles replaced our country friendly routine foods, which in turn skyrockets our lipid levels, blood pressure and blood sugars and also externally it disfigures by moribund central obesity. Lack of physical activity too is the main reason for the increased prevalence of metabolic syndrome. Studies also reported that metabolic syndrome is more common in urban population [6,7].

Our study is designed based on the population studies which shows the metamorphosis of Indian villages. Media and the availability of

goods allowed them to indulge on food, not native to them. We focused on women only because there are not much studies done on them and more than that in most of the families they are the bread winners.

Materials

This study was approved by Ethical Committee Board of Chettinad Hospital and Research Institute, Chennai. After obtaining informed consent,80 female participants were selected in the age group of 20-70 years. Out of 80,40 women were from urban (Madipakkam,Chennai) and 40 were from rural(G.D.kandigai, Gummidipoondi).Women with thyroid diseases, polycystic ovarian syndrome, pregnancy, lactation and other chronic illness were excluded from the study.

Methods

Detailed history was taken about their Occupation, Food habits, Physical activity, past history of Diabetes, Hypertension, Thyroid diseases in the form of Questionnaire. Anthropometric measurements such as Height, Weight, Waist circumference and Hip circumference were measured. BMI and waist to hip ratio was calculated.

Height in centimeters was measured by stadiometer. Weight in kilograms measured by electronic balance. Body mass index was calculated using the formula ,weight in kilograms divided by height in meter2.Waist circumference and hip circumference were measured according to WHO criteria 2008 [8]. Waist to hip ratio was calculated by the formula, waist circumference divided by hip circumference.5ml of blood was drawn from the participants in fasting status and processed on the same day for parameters such as fasting plasma glucose(FPG),serum triglycerides (TGL), serum high density lipoprotein (HDL) cholesterol in Siemens DADE XPAND auto analyzer. Estimation of fasting plasma glucose was done based on HEXOKINASE method. Sensitivity 4.00 -542.50 mg/dl and co-efficient of variation(CV) 1.4%.Estimation of serum TGL was done based on ENZYMATIC methods. Sensitivity 0.60-487mg/dl and CV 2.11%. Estimation of serum HDL cholesterol was done based on POLYETHYLENE GLYCOL(PEG) method. Sensitivity 0.08-165mg/dl and CV 2.8%.Blood pressure was measured by sphygmomanometer(DIAMOND).Metabolic syndrome was diagnosed using modified NCEP – ATPIII criteria[9]. Metabolic syndrome is diagnosed

if they have any of the following 3 out of 5 factors,

1. Central obesity (Waist circumference ≥80cms for females.)
2. TGL ≥150mg/dl
3. HDL ≤50 mg/dl
4. Blood pressure ≥130/85mg/dl
5. Fasting plasma glucose ≥100mg/dl.(10)

RESULTS

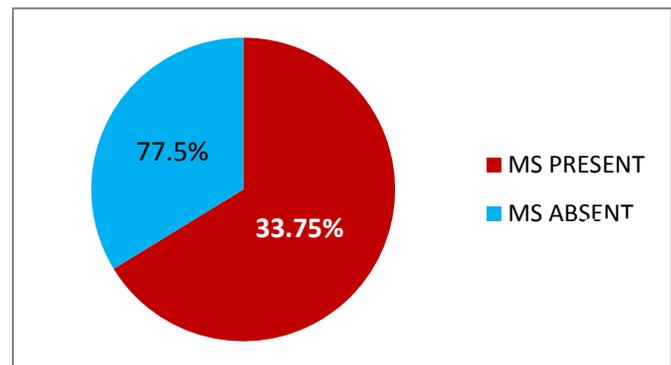Statistical analysis was done using SPSS software version 21.

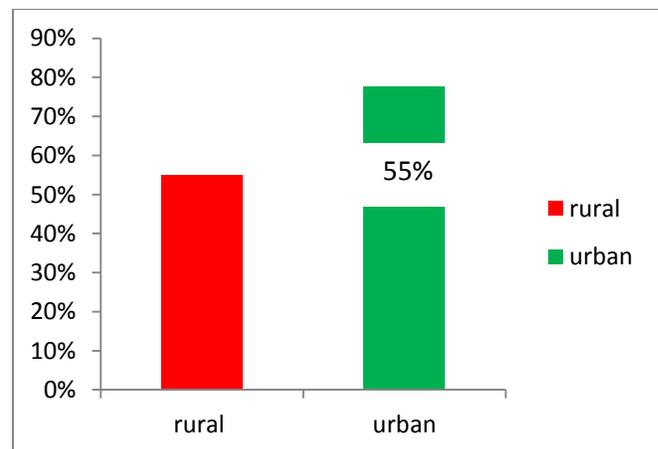**Figure 1 : Prevalence of metabolic syndrome among both groups.**

Figure 2 : prevalence of metabolic syndrome among rural and urban women
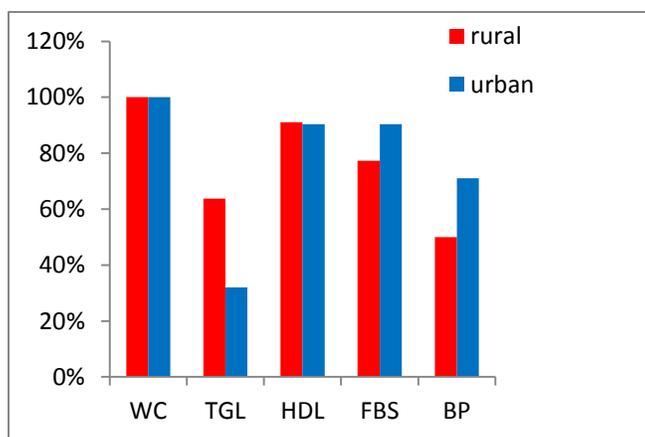
Figure 4 : Prevalence of Individual components in urban women having MS

Discussion

This study has been undertaken to find out the prevalence of metabolic syndrome among rural women. There are only limited studies especially from North India focussed on rural population and couldn't find study based on South Indian rural women. Hence this Pilot study has been designed exclusively to assess the health status of Rural Women, the bread winners in most of the families. Change in lifestyle may be one of the reason but change in environment also plays a role. Absence of rains forced them to work in industries which pushed them from leisurely, healthy lifestyle to fast modernized life where they have to get adapted to fast foods too. The questionnaire helped us to analyze their lifestyle which would have been the culprit.

This cross sectional study included 80 female participants in the age group of 20-70 years. Out of 80, forty were from rural population and forty were from urban population. In rural area, 22 of 40 were diagnosed as metabolic syndrome. In urban area,31 of 40 were diagnosed as metabolic syndrome. Prevalence was expressed as percentage(%).Prevalence of metabolic syndrome among both the groups was observed to be 66.25%.

In our study, prevalence of metabolic syndrome among rural women was about to be 55% which is closely related to the study done by Prasad et al. Also the prevalence of metabolic syndrome among urban women was found to be 77.5%. It is interesting to note down that out of three components(to diagnose MS) increased waist circumference and decreased HDL cholesterol were commonly observed in our study[11,12]. Among these two increased waist circumference was seen in all subjects with Metabolic syndrome as seen in the study of R.K.Kotokey et al[4].

Though some of the individual components are not affected among rural women, the waist circumference and HDL-cholesterol are uniformly affected in all metabolic syndrome subjects. This once again confirms the role of obesity in leading to metabolic syndrome and its close link to inflammation[13,14]. Here the reduction in HDL-cholesterol may be a response to inflammation [15]. Participation of HDL-cholesterol in anti-inflammatory reactions were already well proved[16]. Though it is a small sample study, it helps our institute to develop awareness program for these villages. Though it is conflicting with malnutrition which is highly prevalent in rural areas, the picture clearly shows the prevalence of metabolic syndrome probably due to improper nutrition ie eating only carbohydrates. The questionnaire clearly indicates their level of intake of carbohydrates and it correlates with metabolic syndrome.

Conclusion

Our study states that though urban women show higher prevalence of Metabolic syndrome, rural women also are in the forefront of racing. This is due to urbanization extending from the firms of urban to farms of the rural areas. This to be considered since morbidity and mortality of metabolic syndrome is high.

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