Prevalence of Risk Factors of Diabetes Among Urban Poor South Indian Population

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Abstract

Objective: The objective of the study was to assess the prevalence of risk factors of diabetes among urban poor population in Chennai, Tamil Nadu, South India.

Subjects and Methods: A cross-sectional study was conducted from Dec-2010 to Feb-2011 in Chennai city. Five hundred twenty-nine subjects aged above 18 years (409 women and 120 men) habitants of three slums were randomly selected. A structured questionnaire was used to collect the socio-demographic and clinical information. Anthropometric measures, blood pressure and random blood glucose (RCBG) estimation were done. Dietary intake was assessed using 24-hour diet recall and duration of physical activity/day in all components was recorded.

Results: The mean age and BMI of the study population was 45.4±12.8 years and 25.8±4.9 kg/m² respectively. About 20.4% were illiterate and 34.8% were either unemployed, retired or housewives. Median family income per month was 3000 INR. Prevalence of obesity (≥25 kg/m²) was 57.3% and central obesity (≥90 cms in male and ≥80 cms in female) was 75.7%. The median duration spent in walking, standing and sitting were 30, 120, and 240 minutes/day respectively. There was a gross inadequacy in vegetable intake. The prevalence of self-reported diabetes and hypertension was 20.8% and 24.2%, respectively. Among the subjects without a previous diagnosis of diabetes, 12.5% had RCBG ≥140 mgs. 10.6% were diagnosed with hypertension.

Conclusion: Sedentarism coupled with unhealthy diet pattern are the major contributing factors for the higher prevalence of diabetes and hypertension in urban poor population.

Introduction

India has the second largest population with diabetes next to China. The difference in the growing trends in the prevalence of diabetes within the country is least explored in India. The incidence of diabetes is higher in low socioeconomic group (LSEG) in developed countries.1 Recent studies conducted in developing countries like India2,3 also showed similar trends in the prevalence of diabetes in LSEG compared to the study conducted a decade earlier.3 Although, the risk factors associated with diabetes are similar between the socioeconomic groups, the awareness levels and the insight of the people of LSES on health care access particularly for the screening and management of non-communicable diseases differ.

Material and Methods

A cross-sectional study was conducted during the period of December 2010 to February 2011. A total of 529 subjects aged above 18 years (409 women and 120 men) habitants of 3 slums (Pannaimarathotti, Pudumanikuppam and GM Pettai) were randomly selected from Zone-II (currently classified as Zone-V) of Chennai city. Institutional Ethics committee approved the study. A structured questionnaire was used to collect...
the socio-demographic and clinical information after getting the written consent from the selected subjects.

Anthropometric measures which include height, weight and waist circumference and two blood pressure measurements taken at an interval of 5 minutes were recorded. Random blood glucose (RBG) estimation was done using glucometer (One Touch Ultra Life Scan, UK). Dietary intake was assessed using 24 hour dietary recall for three typical days and average calorie consumption was calculated. Similarly, the duration of physical activity/day in all components viz. workplace, domestic and leisure-time was recorded for two week days and one day in week end. The subjects were categorized as overweight and obese as per Indian obesity guidelines. Diagnosis of hypertension was made using JNC-VII criteria. Descriptive statistics and test of significance were done using SPSS version 16.

Results

The mean age and BMI of study population was 45.4±12.8 years and 25.8±4.9 kg/m² respectively. About 20.4% were illiterate and 34.8% were either unemployed/retired/ housewives. Median family income of the study subjects was 3000INR. About 20.5% of them had reported positive family history of diabetes.

In general, the prevalence of obesity (≥25 kg/m²) was 57.3% and central obesity (≥90 cms in male and ≥80 cms in female) was 75.7%. The prevalence of obesity was significantly higher in women (62.6%) than men (39.2%) \([p<0.001]\). Similarly, central obesity was also higher among women (83.6%) compared to men (51.7%) \([p<0.001]\). In general, the median duration (min/day) spent in walking, standing and sitting by the subjects were 30, 120, and 240 minutes/day respectively. The median duration spent in standing (180 vs 120) and walking (60 vs 30) were significantly higher in men compared to women, whereas duration spent on sitting posture was higher in women (240 vs 120). Average calorie consumed per day was 1783.9 kcals. There was a gross inadequacy in vegetable intake and 14% never ate fruits.

The prevalence of self-reported diabetes and hypertension was 20.8% and 24.2% respectively. Around 12.5% of the subjects, who were not diagnosed with diabetes previously, had RCBG ≥140 mg/dl. Around 10.6% of the study subjects were newly diagnosed with hypertension. There was no gender difference in the prevalence of self-reported diabetes and hypertension.

Discussion

The present study highlights the enormous burden of diabetes, hypertension and its risk factors in LSES. The prevalence of self-reported diabetes among this LSEG was much higher compared to INDIAB study, conducted in the year 2011, which has shown that the generalized prevalence of diabetes was 13.7% in urban centres in Tamil Nadu. This study was conducted in a referral diabetic centre and may be one of the reasons for the high prevalence.

Similar to the present study, a study conducted during 2011; among slum population aged >40 years in Chennai also reported that the prevalence of hypertension and diabetes were 39.2% and 15.4% respectively. A Chennai based study done at two different time points (1998 and 2008) in a same area in Chennai city has observed that there was an increase in general obesity (BMI) of 109% in men and 107% in women. Similarly, the gender specific increase in central obesity rates reported among men and women were 65% and 195% in LSEG. Hence, the trends noticed in the burden of diabetes and hypertension in this population can be mainly attributed to the existing high prevalence of obesity.

The observed trends in the prevalence of diabetes and hypertension are not confined to Southern part of India, as there were few studies from Northern India showing similar trends. A study among slum population in Haryana state has revealed that the prevalence of overweight (BMI ≥25 kg/m²) was 16% among men and 21.9% among women and similar to the present study, they had also reported that the higher proportion of women were physically inactive compared to men (Men vs women; 14.8% vs. 55%). 67% of men and 22.8% of women had reported mean physical activity >150 minutes per week, respectively. About 16.36% of the slum population in Patna were found to be hypertensive and 26.3% of them also had elevated RCBG. The increasing prevalence of diabetes observed in Chennai slum was similar to that of the slum populations in Patna as well. The present study highlighted the higher prevalence of diabetes and hypertension among urban poor population in Chennai. This could be attributed to unhealthy diet pattern and physical inactivity.

In conclusion, the growing body of evidence denotes that the existing and expected burden of diabetes and hypertension in LSEG is huge. Obesity and sedentarism coupled with unhealthy diet pattern are the major contributing factors for higher prevalence of type 2 diabetes and hypertension in urban poor population. Strategies to reduce these modifiable risk factors such as providing a facilitating environment and mass awareness program should be implemented in economically disadvantaged group as well. Obesity prevention program coupled with policy amendments, focusing on development of environment, facilitating safe physical activity is need of the hour.
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References


