

Research Article

Prevalence of Pre-diabetes (Impaired fasting glucose and/or Impaired glucose tolerance) among urban slum dwellers

Sadiya Sultana¹, Pavan Kumar Kulkarni²¹Deccan College of Medical Sciences²Assistant Professor, Preventive and Social Medicine, Deccan College of Medical Sciences

Copyright: © 2016 Sadiya Sultana, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Introduction

Diabetes is one of the most costly and burdensome chronic diseases of the present times. The complications resulting from the disease are a significant cause of morbidity and mortality and are associated with failure of various organs. Type 2 Diabetes also significantly increases the risk for coronary heart disease, peripheral vascular disease and stroke, and such individuals are predisposed to have hypertension, dyslipidemia, and obesity [1].

India leads the world with largest number of Diabetic subjects thus earning the title “the Diabetes capital of the world”. [2] According to the recent estimates by International Diabetes Federation (IDF), India holds the second position among the top 10 countries with largest number of Diabetic adults, having 61.3 million individuals affected by Diabetes. The number is estimated to rise to 101.2 million, by 2030 [3] However, there has been no nationwide survey of Diabetes in India except for ICMR-INDIAB study which was initiated in phase manner (2009). Unfortunately more than 50% of the Diabetic subjects in India remain unaware of their Diabetic status, which adds to the disease burden [4] This underscores the need for mass awareness and screening programmes to identify and overcome the burden due to diabetes in India. Diabetes is traditionally known as a “silent disease,” exhibiting no symptoms until it progresses to severe target organ damage. Therefore, active and opportunistic screening efforts are to be done for case detection [5]

The Government of India has already initiated a National Diabetes Control Programme. For such programmes to be successful, it is necessary to determine cost effective methods for identifying undiagnosed Diabetic subjects in our country. Health awareness among urban slum dwellers is poor with regards to lifestyle disorders evident from past studies.

Pre-diabetes (formerly Borderline diabetes) is a condition wherein the individuals have blood glucose levels that are higher than normal but not high enough yet to indicate diabetes. Fasting blood glucose levels of 100-125mg/dl (IFG) and/or random blood sugar levels of 140-199mg/dl (IGT) indicate Pre-diabetic condition. People with Prediabetes are at high risk of developing type 2 diabetes as well as the serious medical problems which go hand-in-hand with diabetes, including heart disease and stroke. There is 50% increased risk of heart disease and stroke in Pre-diabetic individuals than those who have no Pre-diabetes [6].

The present study aims to screen and identify individuals with impaired glucose tolerance thereby estimating the burden of Pre-diabetes. With early intervention (diet, exercise and health education), the onset of diabetic symptoms and its associated complications could be significantly delayed. This makes screening more cost effective tool for both patient and health care system.

Review of Literature

A nationwide study was conducted by ICMR INDIAB Collaborative study group in this regard, with an objective of determining prevalence of diabetes and prediabetes in India. The prevalence rates of diabetes and prediabetes were assessed by measuring fasting and 2 h post glucose load capillary blood glucose. The prevalence of prediabetes (impaired fasting glucose and/or impaired glucose tolerance) was calculated to be 8.3% in Tamilnadu, 12.8% in Maharashtra, 8.1% in Jharkhand and 14.6% in Chandigarh [7].

Aims and Objectives

The study aims to assess the prevalence of Pre-Diabetes among the urban slum dwellers of Bhavani Nagar. Objectives are to screen and identify individuals with Impaired Glucose Tolerance (IGT) and/or Impaired Fasting Glucose (IFG), and thus estimate the burden of Pre-diabetes in the selected region.

Materials and Methods

The study included a cross sectional survey involving adults aged ≥ 20 years.

Materials used

An interviewer-based questionnaire – Pre-Diabetes risk screening tool by Kentucky Diabetes Network, Inc. [8]

AccuChek Active glucometer, for the measurement of blood glucose levels.

Methodology

The study was carried out among the urban slum dwellers of Bhavani Nagar, Hyderabad. The period of data collection was for 2 months. The individuals aged 20 years and who were not the reported cases of Diabetes (excluding the cases of gestational diabetes), were selected as the sample population for the study. Using a precision of 20% (80% power) and allowing for non-response rate of 20%, the sample size was calculated to be 400 [9] Written informed consent in local language was obtained. The questionnaire was used to assess the risk of Pre-diabetes. In individuals exhibiting any one of the risk factors (besides ethnicity), the Random Blood Sugar levels were

***Corresponding author:** Dr. Sadiya Sultana, MBBS, Deccan College of Medical Sciences, Hyderabad, 500058, India, Tel: +91-9989664603; Fax: +91-9989664603; E-mail: sadiyasultana10@gmail.com

Received: October 11, 2016; **Accepted:** November 21, 2016; **Published:** November 24, 2016

determined using the glucometer. The elevated RBS values were then confirmed by determining Fasting Blood Glucose levels, the following day.

Observations and Results

Table 1: Assessment of Risk Factors for Pre-Diabetes.

Risk Factor	Number of individuals	Percentage
Waist circumference (above 35 and 40 inches in females and males resp.)	250	62.5
BMI (>25)	280	70
Hypertension	320	80
Family history	350	87.5

In the present study, out of 400 individuals, 250 had a waist circumference above 35-40 inches accounting for 62.5%; BMI was more than 25 in about 280 individuals (70%); approximately 320 (80%) were hypertensive and familial predisposition was seen in 350 individuals making around 87.5%.

Discussion

Overall prevalence of pre-diabetes among the respondents was found to be 3.5% in comparison to the nationwide ICMR INDIAB study which reported a prevalence of about 8.3% in Tamilnadu, 12.8% in Maharashtra, 8.1% in Jharkhand and 14.6% in Chandigarh. The risk factors such as waist circumference (more than 35 and 40 inches in females and males respectively), BMI (more than 25), hypertensive and family history were found to be correlated with pre-diabetes.

Conclusion

According to this study the prevalence of pre-diabetes was found to be 3.5%. The present study must be multi-centric to get the exact

results of Pre-diabetes. More studies have to be done to evaluate the risk factors. For the same purpose, the period of study also has to be long (cohort study).

References

1. AmericanDiabetes Association: The prevention or delay of Type 2 Diabetes. <http://care.diabetesjournals.org/content/25/4/742.long>
2. Mohan V, Sandeep S, Deepa R, Shah B, Varghese C (2007) Epidemiology of type 2 diabetes: Indian scenario. *Indian J Med Res* 125: 217-230. [[crossref](#)]
3. Ambady Ramachandran, Ananth Samith Shetty, Arun Nanditha, Chamukuttan Snehalatha: Type 2 Diabetes in India – Challenges and Possible Solutions.
4. Deepa M, Deepa R, Shanti Rani CS, Manjula Dutta (2005) Awareness and knowledge of Diabetes in Chennai-The Chennai Urban Rural Epidemiology Study (CURES-9). *J Assoc Physicians India* 53:283-287.
5. Anjana TRM, Ali MK, Pradeepa R, Deepa M, Datta M, et al. (2011) The need for obtaining accurate nationwide estimates of diabetes prevalence in India - Rationale for a national study on diabetes. *Indian J Med Res* 133: 369-380.
6. WebMD: What is Prediabetes or borderline diabetes? <http://www.webmd.com/diabetes/guide/what-is-prediabetes-or-borderline-diabetes> (as on 25-09-2014)
7. Prevalence of diabetes and prediabetes (impaired fasting glucose and/or impaired glucose tolerance) in urban and rural India: Phase I results of the Indian Council of Medical Research– India DIABetes (ICMR–INDIAB) study: R M Anjana, R Pradeepa, M Deepa et.al.
8. Kentucky Diabetes Network is a statewide partnership striving to improve the treatment and outcomes for Kentuckians with diabetes. This tool may be obtained from www.kentuckydiabetes.net and reprinted in its entirety without permission.
9. Anjana RM, Pradeepa R, Deepa M, Datta M, Sudha V, et al. (2011) The Indian Council of Medical Research-India Diabetes (ICMR-INDIAB) study: methodological details. *J Diabetes Sci Technol* 5: 906-914. [[crossref](#)]