Prevalence of Diabetes Mellitus and its Risk Factors in Urban Field Practice Area of Chitradurga

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Abstract

Introduction: Diabetes mellitus is one of the non-communicable disease which has become a major global health problem. A study done by the Indian Council of Medical research (ICMR) in 1970s reported a prevalence of 2.3% in urban areas[1,2] which has risen to 12-19% in 2000s. Although improving control of diabetes in India is important, the associated risks of tight control in high risk groups should also be kept in mind.

Objectives: To study the prevalence of diabetes in urban population and to estimate the usefulness of the Indian diabetes risk score for detecting undiagnosed diabetes.

Materials and Method: This is a community-based cross-sectional (descriptive) study carried out in the urban field practice area of Basaveswara Medical College and hospital which covers a population of 31186 from July to October 2019. Data was collected by using a validated questionnaire by house to house visit to find out the prevalence and the risk of diabetes mellitus in general population by using Indian diabetes risk score.

Results: A total of 624 respondents were interviewed. Among them 298(24.35%) females and 326(26.63%) were males. Most 422(34.48%) had no family history of diabetes mellitus and 338 (27.61%) individuals were in the overweight category. Out of these overweight persons, 36.6% had high diabetic risk score.

Keywords: *IDRS; Risk for diabetes; Socio-demographic factors.*

Introduction

Diabetes Mellitus is an" iceberg" disease. It is one of the noncommunicable disease which has become a major global health problem. There is increase in both prevalence and incidence of diabetes globally. The global diabetes prevalence in 2019 is estimated to be 9.3% (463 million people), rising to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045. The prevalence is higher in urban (10.8%) than rural (7.2%) areas, and in high-income (10.4%) than low-income countries (4.0%).[1] The Indian Council of Medical Research (ICMR) study done in the 2017s reported a prevalence of 7.3% in 17 states of India.[2] Thus, the prevalence rates of diabetes are increasing rapidly.

Because of the increasing burden of the disease, its iceberg nature, its complications and the potential to prevent these complications with effective diagnosis and treatment, active efforts are required for the early diagnosis of diabetes. The risk factors like age, gender, family history are non-modifiable while others like smoking, diet, physical activity, hypertension, diabetes etc. are modifiable. Thus for noncommunicable diseases a typical screening or preventive strategy may not work and principles of primordial prevention have to be applied effectively. Early identification of at-risk

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individuals and appropriate lifestyle intervention would help in preventing or postponing the onset of diabetes mellitus. This highlights the need for simple, low cost tools to aid early screening of diabetes.[3]

A novel approach utilising simple non-invasive scores can offer a potential for mass screening programmes. The Indian Diabetes Risk Score (IDRS) was developed by V Mohan and his colleagues in Madras Diabetes Research Foundation (MDRF), Chennai and is considered to be one of the strongest predictor of incident diabetes in India.[4] It is for identifying undiagnosed diabetic subjects using four simple parameters like age, waist circumference, family history of diabetes and physical activity. It is an efficient tool to categorize the risk of diabetes mellitus in community. It also helps in detecting undiagnosed type 2 diabetes. The present study aims at assessing the risk for type 2 diabetes mellitus among adults in urban area of Chitradurga.

The aim of this study is to assess the risk of diabetes mellitus in adults above 20 years, using the Indian diabetes risk score (IDRS) developed by Mohan *et al*.[4] The specific objectives are to study the prevalence of diabetes in urban population and to estimate the usefulness of the Indian diabetes risk score (IDRS) for detecting undiagnosed diabetes.

Materials and Method

A cross-sectional (descriptive) study carried out in the urban field practice area of department of Community Medicine, Basaveswara Medical College, Chitradurga, covering the total population of 31186. From the center, four wards were selected by purposive sampling, and all population above the age of 20 years, presented on the day of survey and willing to participate were taken as a sample population for the study. The total number of selected subjects were 700 (13%- non - responder) and surveyed sample from all four wards was 624. The duration of survey was from July to Oct 2019.

In all subjects, family history of Diabetes was obtained and details on physical activities and other parameters were assessed using a validated questionnaire.[5] Waist measurements were obtained using standardised technique. Physical activity assessed by asking the following question (A) How physical demanding is your work (occupation)? (B) Do you exercise regularly in your leisure time? (C) How would you grade your physical activity at home? Than combined score of A+B+C = >3 vigorous/strenuous, 2 moderate, 1 mild, 0 sedentary was calculated. Analysis for high risk was done as per Indian Diabetes Risk Score (IDRS) developed by Mohan *et al,*[4] and parameters comprising two modifiable (waist circumference, physical activity) and two non-modifiable risk factors (age, family history) for diabetes.

IDRS analysis was done using all the four parameters: If age <35 years score = 0; if 35-49 years score = 20; if>50 years; score = 30; waist circumference < 80 cm for female and <90 cm for male then score = 0; >80-89 cm for history = 0, family history present either parent = 10, both parents =20. After adding all four parameters high risk score (>60 very high risk, 30-50 moderate risk, <30 low risk) was helpful to identify subjects at high risk for diabetes and also raised awareness about diabetes and its risk factors. activities vigorous exercise or strenuous work score= 0; moderate exercise work/home = 10; mild exercise work/home = 20; no exercise and sedentary work/home= 30; family history of diabetes, no family history = 0, family history present either parent = 10, both parents =20. After adding all four parameters high risk score (>60 very high risk, 30-50 moderate risk, <30 low risk) was helpful to identify subjects at high risk for diabetes and also raised awareness about diabetes and its risk factors. No ethical issues were involved as no intervention was carried out; however, verbal consent was obtained to proceed with the survey.

Data were entered into Microsoft excel sheet and analyzed using SPSS 17.0 software. Frequency and percentages (descriptive statistics) were calculated. Pearson's Chi-square was used as a test of significance. P-value < 0.05 was considered statistically significant.

Results

A total of 624 respondents were interviewed of these, 272(43.59) were in 20-30 years' age group, 326(52.2%) were females. Majority 380(60%) were Hindus. A total of 304(48.72%) subjects were at moderate risk (IDRS 30-50) for diabetes and 232(37.18%) had high risk for diabetes (IDRS>60) [Table 1].

Table 1: Distribution of respondents according to socio demographic Profile.

Category		Number	Percentage %
Age Group	20- 35 years	272	43.59
	36-49 years	156	25.00
	> 50 years	196	31.41
Sex	Male	298	24.35
	Female	326	26.63
Religion	Hindu	380	60.90
	Muslim	244	39.10
IDRS Score category	>60 (Very high)	232	37.18
	30-50 (Moderate risk)	304	48.72
	<30 (low Risk)	88	14.10

Table 2: Distribution of respondent according to their body mass index (BMI) status and diabetes risk as per Indian diabetes risk score (IDRS)

Body Mass Index	Indian Diabetes Risk Score			
	Low	Moderate	Very High	Total
<18.5 (Underweight)	16 (47.1)	2 (5.9)	16 (47.1)	17 (100)
18.5-24.99 (Normal range)	76 (30.2)	84 (33.3)	92(36.5)	126 (100)
25-29.99 (Pre obese)	56 (20.3)	120 (43.5)	100(36.2)	138 (100)
30 and above (Obese)	12 (19.4)	26(41.9)	24(38.7)	31(100)
Total	**160 (25.6)**	**232(37.2)**	**232(37.2)**	**624(100.0)**

P Value – 0.04

There was a statistically significant association between body mass index and Indian Diabetes Risk Score.

Table 3: Distribution of respondents according to their known status of diabetes and IDRS.

Total subjects studied (N= 624)		High IDRS in known diabetic (N= 104)	
Known cases of diabetes	Percentage	Number	Percentage
104	16.7	74	71.15

Prevalence of diabetes in studied population was 16.7 %. Out of these, 71.15% of known cases of diabetes mellitus had high (>60) IDRS. Co-relation between BMI and IDRS shows that, if BMI increases from less than 18.50 to more than 30, chances of high risk for developing diabetes mellitus also significantly increase.

Discussion

In the present study, the prevalence of people at high risk of diabetes was 37.18%.A study conducted by Reshma S Patil *et al.*[6] in 2011–12 in an urban slum of Pune, Maharashtra reported the prevalence of high risk to be 37% which is similar to our study. Whereas a study conducted at urban Pondicherry by Sanjay Kumar Gupta[7] was 31.2% and in Rural TamilNadu[8] was 18.66%. A study conducted at Mysuru district the people at high risk of diabetes was 22%.[9]

There was a statistically significant association between body mass index and Indian Diabetes Risk Score. Similar results were observed by Sanjay Gupta at Rural area of Tamilnadu.[8]

According to the study conducted by Sanjay Kumar Gupta *et al*. in an urban area of Pondicherry [7] only 12% of the people who had diabetes had a positive family history and in our study 57.69% of the respondents gave

a positive family history. This difference may be due to different life-styles and socio-economic status of the respondents.

Prevalence of diabetes in studied population was 16.7%. Out of these, 71.15% of known cases of diabetes mellitus had high (>60) IDRS. Similar results were observed in a study conducted at urban Pondicherry. In their study 76.47 % of known cases of diabetes mellitus had high IDRS.

Conclusion

This study estimates the usefulness of simplified Indian diabetes risk score for identifying undiagnosed high risk diabetic subjects in India. Use of the IDRS can make mass screening for undiagnosed diabetes in India more cost effective.

Ethical Clearance: Taken from Institutional ethical committee of Basaveshwara Medical College and Hospital Chitradurga.

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Conflict of Interest: There is no conflict of Interest

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