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Original Research Article

Risk factor assessment and screening for diabetes in field practice area of a private medical college in Thiruvallur district of Tamil Nadu

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ABSTRACT

Background: Diabetes, which was known to be an epidemic in the urban areas, has been found to be increasing rapidly in the rural areas too as a result of the socioeconomic transitions. Diabetes is no longer only a disease of the elderly but is one of the major causes of morbidity and mortality affecting youth and middle aged people.
Methods: Screening camp for diabetes was conducted by the Department of Community Medicine in three different areas in the field practice area of Saveetha Medical College and Hospital viz. Thirumazhisai, Kuthambakkam and Velavedu in Thiruvallur district of Tamil Nadu on 7th April 2016 as a part of World Health Day 2016 celebration. Data was collected using a predesigned interview schedule. Descriptive statistics was calculated using rates, ratios & proportions. Univariate analysis was done using Chi square test to find the association between various factors and diabetes status. A parsimonious regression model was developed to find the predictor variables for diabetes.
Results: A total of 188 people aged above 18 years attended the screening camps. Majority of the camp attendees were females (62.2%). Proportion of people having diabetes (already diagnosed plus newly screened) was found to be 18.1% out of which 3.2% were screened positive for diabetes. On regression analysis, Intake of alcohol and perceived stress were found to be significantly associated with diabetes ($p<0.05$).
Conclusions: This study highlights a significant burden of undiagnosed cases of diabetes in the community. This indicates the need for systematic screening and awareness programs to identify the undiagnosed cases in the community and offer early life style modifications, treatment and regular follow up to such individuals.

Keywords: Risk factors, Screening, Diabetes

INTRODUCTION

The prevalence of diabetes mellitus (DM) is growing rapidly worldwide and is reaching epidemic proportions.[1,2] Diabetes prevalence has been rising more rapidly in developing countries of the world where the disorder predominantly affects younger adults in the economically productive age group.[3] The global prevalence of diabetes among adults over 18 years of age has risen from 4.7% in 1980 to 8.5% in 2014.[4] According to International Diabetes Federation estimates, around 415 million people had DM in 2015 and this number is expected to rise to 642 million by 2040.[5]

India leads the world with largest number of diabetic subjects earning the title "Diabetes capital of the world". India is home to 69.1 million people with DM and is estimated to have the second highest number of cases of DM in the world after China in 2015.[6]

Type 2 diabetes results from the interaction of both genetic and metabolic risk factors. Ethnicity, family

history of diabetes, older age, overweight and obesity, unhealthy diet, physical inactivity and smoking are the most commonly reported risk factors.[7]

Diabetes, which was known to be an epidemic in urban areas have found to be increasing rapidly in rural areas too as a result of the socioeconomic transitions.[8] Diabetes is no longer only disease of the elderly but is one of the major causes of morbidity and mortality affecting youth and middle aged people.

Diabetes also known as a "silent disease," exhibiting no symptoms until it progresses to severe target organ damage.[9] Because of increasing burden of the disease, its iceberg nature, its complications and potential to prevent these complications with earlier diagnosis and treatment; active and opportunistic efforts are required for early diagnosis of diabetes by means of screening.[9] Early identification of individuals with risk factors and appropriate lifestyle intervention would help in preventing or postponing the onset of diabetes mellitus. Hence this study was planned to assess prevalence and risk factors associated with diabetes among adults.

METHODS

On account of World health day 2016 Diabetes screening camps were conducted by the Department of Community Medicine in three different areas in the field practice area of Saveetha Medical College and Hospital viz. Thirumazhisai, Kuttampakkam and Velavedu on 7th April 2016. People were given prior information about the screening camp through pamphlets. Informed consent was taken from all the participants who came for the camp. Data was collected from the participants using a structured interview schedule which contained information regarding socio demographic details, various risk factors for diabetes like dietary practices, smoking and alcohol consumption, physical activity levels, family history of diabetes and history of diabetes in the past.

Height and weight was checked using standardized methods and body mass index (BMI) Body mass index (BMI) was categorized using the classification recommended for Asians.[10] Blood pressure was checked twice using BP apparatus and the lowest reading was recorded. Risk factors were assessed through questionnaire and physical examination. Random blood sugar using Roche ACCU-CHEK was used to screen diabetes mellitus, random blood sugar ≥200 mg/dl was used as cutoff to label as diabetics and 140-199 mg/dl was used as cut off to label as IGT (Impaired Glucose tolerance)

Hypertension

Individuals diagnosed by a physician and on antihypertensive medications (self-reported) and/or those who had systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg on examination were labeled as having hypertension. —Joint National Committee 8 (JNC8) Criteria.[11]

Diabetes

Individuals diagnosed by a physician and/or on anti-diabetic medications and/or those who had random blood glucose ≥200 mg/dl on the day of examination were labeled as diabetics.

Statistical analysis

Data was analysed using Statistical Package for Social Sciences (SPSS) software version 16. Descriptive statistics in the form of rates, ratios & proportions were calculated. Univariate analysis was done using Chi-square test to find the association between various factors and diabetes status. Multiple logistic regression using backward (LR) method was done to find the predictor variables for diabetes.

RESULTS

Total 188 people above 18 years attended the screening camps. Majority of the camp attendees were females (62.2%). More than one third (33.5%) of the subjects were between 41-50 years of age (Table 2).

Table 1: Results of diabetes screening in the study population.

Diabetes status	Frequency	Percentage (%)
Normal glucose reading <140 mg/dl	89	47.3
Impaired glucose tolerance (IGT) 140 mg/dl to 199 mg/dl	65	34.6
Diabetes >200 mg/dl (screened positive)	6	3.2
Known diabetes	28	14.9
Total	188	100.0

Table 2 shows out of 188 people who attended the screening camps 28 were the known case of diabetes, out of which 27 gave history of seeking treatment for diabetes.

Among 160 people who were never diagnosed to be diabetic, 71 subjects in the present study were found to have random blood sugar more than 140 mg/dl, out of which 6 (3.2%) of the study subjects were screened to be positive (>200 mg/dl), and 65 (34.6%) were detected with Impaired glucose tolerance (140 mg/dl-199 mg/dl).

In the present study proportion of people having diabetes (already diagnosed plus newly screened) was found to be 18.1% out of which 3.2% were screened positive for diabetes. All the 6 people screened positive in the camp complained of increased frequency of micturition and numbness of lower limbs.

Table 2: Age wise distribution of diabetes and impaired glucose tolerance (IGT).

Age group in years	Diabetes	IGT	Normal	Total
18-40	3 (5.1)	20 (34.4)	34 (58.6)	57 (30.8)
41-60	21 (20.1)	37 (35.5)	46 (44.2)	104 (55.3)
>60	10 (37)	8 (29.6)	9 (33)	27 (14.3)
Total	34	65	89	188

p<0.05.

Table 3: Gender wise distribution of diabetes and impaired glucose tolerance (IGT).

Sex	Diabetes (n=34)	IGT (n=65)	Normal	Total
Male	12 (16.9)	22 (30.9)	37 (52.1)	71
Female	22 (18.8)	43 (36.7)	52 (44.4)	117
Total	34 (18)	65 (34.5)	89 (47.3)	188

Table 4: Risk factors associated with diabetes.

Risk factors	Diabetes (n=34) N (%)	Normal (n=154) N (%)	Frequency (n=188) N (%)
Illiteracy	12 (35.2)	31 (20)	43 (22.9)
Mixed diet	30 (88.2)	147 (95.4)	177 (94.1)
Stress	11 (32.3)*	25 (16)	36 (23.4)
Tobacco smoking	3 (8.8)	19 (12.3)	22 (11.7)
Alcohol intake	8 (23.5)*	13 (11)	21 (11.1)
Family history of diabetes	22 (64.7)*	37 (24)	59 (31.4)
Overweight/obesity	28 (82.3)*	63 (40.9)	91 (48.4)
Hypertension	13 (38.2)*	16 (10.3)	29 (15.4)
Sedentary worker	12 (35.2)	56 (36.3)	68 (36)

*p<0.05

In the present study prevalence of diabetes was found to increasing with the age of the participants, 37% in more than 60 years, 20.1% in 41-60 years and only 5.1% in less than 40 years and the association was found to be statistically significant (Table 2).

In the present study no association was found between gender and diabetes (Table 3).

In the present study on univariate analysis alcohol intake, family history of diabetes, stress, overweight/obesity and hypertension were found to be more among people with diabetes and the difference was found to be statistically significant p<0.05 (Table 4).

Multiple logistic regression was done by Backward Elimination Likelihood Ratio method. Alcohol intake and perceived stress were found to be significantly associated with Diabetes (p<0.05).

DISCUSSION

In the present study proportion of people having diabetes was found to be 18.6%. 3.2% people were screened to be positive for diabetes. The first prevalence study done by Indian Council of Medical Research (ICMR) at the national level (1979) reported 2.8% prevalence of diabetes in rural areas.[9] Shridhar et al reported a prevalence of 2.8% of diabetes in rural Hyderabad. Rao et al reported 2.4% prevalence of diabetes in the rural areas in Chennai (1989).[12,13] Barik et al in a large cross-sectional survey in rural West Bengal, found that the prevalence of diabetes and pre-diabetes among adults >18 years was 2.95 and 3.34% respectively.[14] In another study, Little et al reported a high prevalence of type 2 diabetes (10.8%) among adults population (>19 years) in rural parts of South India. [15]

These figures imply that though the prevalence of DM varies in different settings, it is certainly quite high and warrants immediate attention. Our study adds to the limited but growing body of evidence suggesting that diabetes is no longer confined to urban areas of India and is a matter of concern in rural areas as well.[16]

In our study increase in age, alcohol intake, family history of diabetes, stress, overweight/obesity and hypertension were found to be associated with diabetes. Many studies have also found a positive association with family history, hypertension and overweight with Diabetes.[14-18]

More than one third of the people were found to have random blood sugar more than 140 mg/dl indicating high

proportion of population at risk of developing diabetes in future if preventive measures including life style modification are not followed.

CONCLUSION

The present study report a high burden of Diabetes Mellitus among adult population in a selective population in semiurban area in Thiruvallur district of Tamil Nadu. Around 18.6% people had diabetes and 34.6% had Impaired glucose tolerance, calling for urgent attention. This study also highlights a significant burden of undiagnosed cases of Diabetes in the community. This indicates the need for systematic screening and awareness program to identify the undiagnosed cases in the community and offer early life style modifications, treatment and regular follow up.

Study limitations

This is a camp based study. Larger studies are needed in future for finding out the prevalence and risk factors of diabetes in rural community.

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