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Original Research Article

Screening for diabetes mellitus among the rural population applying Indian diabetes risk score in field practice areas of Kamineni Academy of Medical Sciences and Research Centre

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ABSTRACT

Background: Globally an estimated 422 million adults are living with Diabetes as per WHO data 2014, and 85 to 90% cases are type 2 diabetes. Maximum number of people with diabetes mellitus are in the age group of 40 to 59 yrs. Among them 50% are undiagnosed. Sedentary lifestyle, diet, dietary fiber, mal-nutrition, some chemical agents, stress, alcohol, viral infections, etc., are some environmental risk factors.
Methods: A cross sectional, community based study. Details of the study subjects were recorded using structured predesigned and pretested questionnaire. All the data collected was entered and analyzed with MS Excel software 2007 and Epi info 3.5.3. All tests were considered significant at $p < 0.05$ level.
Results: In our study, majority of population participated in the screening camp are between 30 to 35 years of age, Female (53.2%) participants were more. We found that 38 (24.1%) persons were found to be in pre-diabetic stage, 57 (37.3%) are having high risk of getting diabetes.
Conclusions: There is significant relationship between smoking, alcohol consumption and sedentary lifestyle ($p<0.05$) to the risk of diabetes as per Indian diabetes risk score.

Keywords: Indian diabetic risk score, Pre diabetes, Screening

INTRODUCTION

Diabetes mellitus (DM) is an "iceberg" disease. Globally an estimated 422 million adults are living with Diabetes as per WHO data 2014, and 85 to 90% cases are type 2 diabetes.[1] In India as per WHO data in 2015, 69.2 million people are suffering from Diabetes. Around 80% of adults with DM are living in low and middle income countries. Maximum number of people with DM are in the age group of 40 to 59 yrs. Among them 50% are undiagnosed.[1] The prevalence in Hyderabad is 17%.[2] Recent population based studies in India, Bangladesh and Indonesia showed considerable increase in the prevalence rate of Diabetes in both urban and rural dwellers.[3]

Waist circumference or waist to hip ratio are more powerful determinants for Type 2 DM than BMI.[4] Physical inactivity and/or deficiencies of specific nutrients may also be involved in the causation of type 2 DM.[5]

Central obesity is also an important determinant of insulin resistance in type 2 DM. Sedentary lifestyle, diet, dietary fiber, mal-nutrition, some chemical agents, stress,

alcohol, viral infections, etc., are some environmental risk factors. Hence the study was planned to conduct screening for the diabetes among rural population using Indian diabetic risk score (IDRS).[6]

Aim and objective of this study was to predict the risk of diabetes among rural population by using IDRS and to identify the factors influencing the diabetic status of the study population.

METHODS

The present study was conducted by Department of Community Medicine in the filed practice area under Rural Health Training Centre (RHTC), Pasumamala, through a screening camp, with prior publicity in the village.

Study design

This was a cross sectional, community based study.

Study variables

Details of the study subjects were recorded using structured, pre-designed and pre-tested questionnaire which includes socio-demographic variables (age, sex, address) and details of clinical examination, GRBS and Indian diabetic risk score (IDRS score >60: very high risk of having diabetes, 30-50 medium risk, <30 low.

Sample size

All 158 eligible consenting subjects attending the screening camp were included in the study.

Data compilation and analysis

All the data collected was entered and analyzed with MS excel software 2007 and Epi info 3.5.3. All tests were considered significant at $p<0.05$ level.

Inclusion criteria

Study subjects age >30 years were included.

Exclusion criteria

Subjects <30 years of age, known diabetic cases, who are not willing to participate in the study were excluded.

Period of the study: The first week of February 2019, when the screening camp was conducted.

Consent: The study subjects were informed about the purpose.

Initially, the socio demographic data was recorded followed by general physical examination and the risk scoring for diabetes was done by using Indian diabetic score. The study population who had the high risk of diabetes (IDRS>60) were subjected to fasting and post lunch blood sugar levels and were followed up.

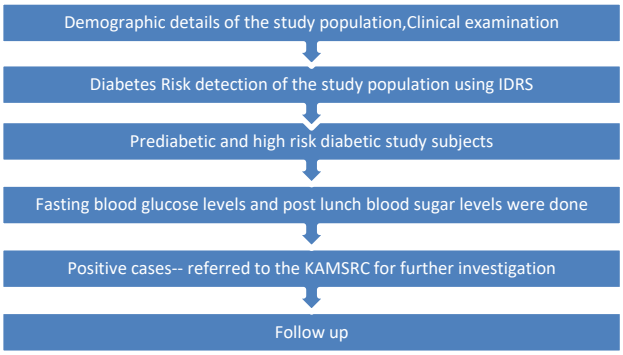

Figure 1: Study plan.

Table 1: Indian diabetic risk score.

Particulars	Score
Age in years	
<35	0
35-50	20
>50	30
Waist circumference	
Waist circumference <80 cm in females (32'') 0R <90 cm in males (36'')	0
Waist circumference <80-89 cm in females (32''-36'') 0R <90-99 cm in males (36''-39'')	10
Waist circumference >90 cm in females (36'') 0R >100 cm in male (40'')	20
Physical activity	
Vigorous regular exercise or strenuous manual labor at home or work	0
Mild to moderate regular exercise or moderate activity at home or work	20
No exercise and sedentary work at home or work	30
Family history	
No family history	0
Either parent diabetic	10
Both parents	20

RESULTS

In this study that majority of population participated in the screening camp are between 30 to 35 years of age (19.6%), 45-50 (19.6%) followed by 40-45 (18.3%) years. (Table 2). Female (53.2%) participants are more when compared to males (46.8%) (Table 3). It is found that 38 (24.1%) persons were in pre-diabetic stage, 57 (37.3%) are having high risk of getting Diabetes and the remaining 61 persons (38.6%) were found to be not under risk of Diabetes as per IDRS (Table 4).

High risk for Diabetes is found to be higher in the age group of 40-45 (55.2%) years, followed by 45-50 years age group (51.7%) in the present study (Table 5).

Table 2: Age wise distribution of the study population (n=158).

Age in years	Number (%)
30-35	31 (19.6)
35-40	28 (17.7)
40-45	29 (18.3)
45-50	31 (19.6)
55-60	22 (13.9)
>60	17 (10.7)
Total	158 (100)

Table 3: Sex wise distribution of the study population (n=158).

Sex	No (%)
Male	74 (46.8)
Female	84 (53.2)
Total	158 (100)

It is found that 29.7% and 32.4% are pre-diabetes, and high risk for diabetes respectively among male population. In female population, 19.1% and 41.6% are prediabetes and high risk for diabetes respectively (Table 6).

Table 4: Distribution of study subjects according to diabetic status (n=158).

Condition	Number (%)
Non Diabetics	61 (38.6)
Pre diabetic condition	38(24.1)
High risk of diabetes	59(37.3)

Table 5: Age wise distribution of the study population according to risk of diabetes (n=158).

Age in years	Non diabetic (%)	Pre diabetics (%)	High risk for diabetes (%)	Number (%)
30-35	17 (54.9)	6 (19.4)	6 (19.4)	31 (100)
35-40	13 (46.4)	6 (21.4)	9 (32.2)	28 (100)
40-45	8 (27.5)	5 (17.3)	16 (55.2)	29 (100)
45-50	7 (22.2)	9 (29.1)	16 (51.7)	31 (100)
55-60	8 (36.4)	7 (31.8)	7 (31.8)	22 (100)
>60	8 (47.1)	5 (29.4)	4 (23.5)	17 (100)

It is found that there is significant relationship between smoking, alcohol consumption and sedentary lifestyle ($p<0.05$) to the risk of diabetes (Table 7).

Table 6: Sex wise distribution of the study population according to risk of diabetes (n=158).

Sex	Non diabetic (%)	Pre diabetics (%)	High risk for diabetes (%)	Number (%)
Male	28 (37.8)	22 (29.7)	24 (32.4)	74 (100)
Female	33 (39.2)	16 (19.1)	35 (41.6)	84 (100)
Total	61 (38.6%)	38 (24.05%)	59 (37.34%)	158 (100)

Table 7: Factors influencing the status of diabetes among the study population (n=158).

	Diabetic risk	No risk	Total (%)
Smoking +	52 (53.6)	46 (75.4)	98 (62.02)
Smoking -	45 (46.39)	15 (24.59)	60 (37.97)
	P<0.05		
Alcohol +	67 (69.07)	43 (70.49)	110 (69.62)
Alcohol -	30 (30.92)	18 (29.5)	48 (30.37)
	P<0.05		
Obesity /Over weight	71 (73.19)	47 (77.04)	118 (74.68)
Normal weight	26 (26.8)	14 (22,95)	40 (25.31)
	P<0.2		
NO Regular physical activity	68 (70.1)	53 (86.88)	121 (76.58)
Regular physical activity	29 (29.89)	08 (13.11)	37 (23.41)
	P<0.05		

DISCUSSION

In this study that majority of population participated in the screening camp are between 30 to 35 years of age (19.6%), 45-50 (19.6%) followed by 40-45 (18.3%) years. Acharya et al found that three-fourths of the study subjects belonged to 30-49 age group. The overall mean age was 43.38 (±11.26) years with range 30-75 years in their study.[7]

In the present study female (53.2%) participants are more when compared to males (46.8%), which is found to be similar in the study 7 where out of 580 subjects 53.96% were women and 46.03% were men. In the present study, it is found that 38 (24.1%) persons were found to be in pre-diabetic stage, 57 (37.3%) are having high risk of getting Diabetes as per IDRS. In a study by Geethamani et al it was observed that 59% of the participants were classified under high risk category, 30% had moderate

risk and 11% had low risk.[8] In another study by Acharya et al, it was observed that 5.3% were in low risk category, 43.2% were in moderate risk category and 51.3% were in high risk category.[7] Study conducted by Nandewar et al, in Bhopal showed that out of 250 subjects (2.80%) were in low risk, (28.40%) in moderate risk and (68.80%) were in high risk group as per the IDRS.[5]

High risk for Diabetes is found to be higher in the age group of 40-45 (55.2%) years, followed by 45-50 years age group (51.7%) in the present study. Turale et al in their study found that moderate risk was found in the age group of >40 years and are having high chances of pre diabetic condition.[9] Very high risk of Diabetes was found in the age group of >50 years and these persons having the risk of becoming diabetes in coming years. In the present study we found that 29.7% and 32.4% are pre-diabetes, and high risk for diabetes respectively among male population. In female population, 19.1% and 41.6% are prediabetes and high risk for diabetes respectively. In the study conducted by Turale et al, female individuals were more than male individuals.[9] In our study, it is found that there is significant relationship between smoking, alcohol consumption and sedentary lifestyle ($p<0.05$) to the risk of diabetes. Mani et al in her study shows that there was a statistically significant association of diabetes risk with BMI. The risk of having diabetes is increasing as BMI is increasing in the overweight and obese group of population. Similarly, there was no statistically significant association between diabetes risk and stress ($p=0.32$) and behavioral risk factors like smoking, tobacco and alcohol use.[8] However, these findings do not corroborate with those of our findings. In a study by Revathi R et al, significant association was found between smoking and DM ($p<0.05$).[10] Smokers have 1.8 times higher risk of developing diabetes compared to non-smokers. The association between Body Mass Index and diabetes is not statistically significant. Obese individuals have 1.75 times higher risk of developing diabetes compared to non-obese individuals.

CONCLUSION

The risk of getting diabetes in more as the age increases both in male and females. Population with Smoking, alcohol consumption and sedentary lifestyle are more prone for diabetes.

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