A Community Based Study on Assessment of Diabetes Risk Using Indian Diabetic Risk Score

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ABSTRACT

Background: Globally around 422 million adults (>18years) have diabetes and 1.6 million deaths were directly caused by diabetes. WHO projects that diabetes will be the seventh leading cause of death in 2030. This study conducted to assess risk of diabetic using Indian diabetic risk score (IDRS) and also to determine association between non socio demographic factors and diabetes risk

Methodology: This is a cross sectional study conducted in rural field practice area of Dr. B R Ambedkar Medical College, Bengaluru for two months (March and April 2017)using pretested semi-structured questionnaire and Indian diabetic risk score (IDRS).

Results: Out of 523 study subjects, half of them were in the age group of more than 45 years of age (53.5%) and number of males and females were almost equal. More than half were at medium risk (59.3%) of diabetes and one fourth of them were at higher risk of diabetes (28.7%). Significant association of diabetes risk was found with alcohol consumption and physical activity (P< 0.05).

Conclusion: More than 70% of study subjects were at high and medium risk of diabetes. There was significant association between diabetes risk with alcohol consumption and physical activity.

Key Words: IDRS, Diabetes mellitus, diabetes risk

INTRODUCTION

Diabetes is a growing challenge affecting both developing and developed countries. In India around 8.7% of individual in the age group of 20-70 years are diabetic. Diabetes and other noncommunicable diseases are due to combination of factors like rapid urbanization, sedentary lifestyles, unhealthy diets, tobacco use, and increasing life expectancy. Among the multiple factors obesity and overweight are most important contributing factors.[1] With increasing burden of diabetes, it's the leading cause of mortality and morbidity worldwide.[2,3]

Diabetes is a disease that has long latent asymptomatic stage before it could be diagnosed and treatment. With availability of tests we can screen the individual in the community and initiate treatment that reduces the complications of diabetes including micro and macro vascular complications. [4,5]

Various non-invasive simple tools have been developed for different countries like ADA risk test, the diabetic risk score by Finnish group.[6] Similar tool is developed in India from CURES cohort study called IDRS (Indian diabetic Risk score). These tools are mass screening tools which are based of population criteria from different countries. CURES is a largest population based study on diabetes with sensitivity and specificity of 72.5% and 60.1% respectively and it is simpler and user friendly tool for screening individuals for diabetes.[7]

Determining the risk of individual for diabetes helps in early diagnosing of the disease and also initiating treatment. This helps in halting the progression of disease and reducing the complications of diabetes. This study was conducted to assess risk of Diabetes using Indian Diabetic Risk Score and also to determine association between non socio demographic factors and diabetes risk

METHODOLOGY

This is a community based cross sectional study conducted in Sathnur, Halasuru, Kadahalli, Bhuhalli villages under purview of rural field practice area of department of Community Medicine of Dr B R Ambedkar medical college, Bangalore. The study was conducted for a period of two months (March and April 2017). House to survey was conducted and subjects from selected area who were more than or equal to 18 years of age and not a known case of diabetes were included in our study. This procedure was repeated for a period of two months. Study subjects who fulfilled the inclusion criteria; informed consent for participation in our study was taken and were included in our study. Only those individuals who were available during our visit were included and no second visit was done to cover the missed individuals. When more than one subject more than 18years were found in a house, only one individual was randomly selected and included in our study. Data was collected using pretested semi structured questionnaire and IDRS scoring.[7] Questionnaire consisted of three sections; socio demographic variables, habits like alcohol & smoking and Indian diabetic risk scoring. IDRS consists of four components i.e age, physical activity, waist circumference and family history of diabetes with scoring for each of these components. Using IDRS scoring study subjects with score less than 30 were considered as low risk, 30-50 as medium risk and >60 as high risk of diabetes. Association of diabetic risk was assessed with factors like physical activity, habits like alcohol and smoking, family history of diabetes and body mass index. Chi square test was applied to determine the association between IDRS risk and other variables. P value of less than 0.05 was considered statistically significant.

RESULTS

Table 1: Out of 523 study subjects, half of them were in the age group of more than 45 years of age (53.5%), one fourth belong to 35-45 years of age (28.3%). Very few were in the age group of less than 35 years. Number of males and female population was almost equal (47.8% and 52.2%). Maxi-

mum of them were Hindus and very few belonged to Muslim religion (1.5%). Most of them belong to SES class II and III. None of the study subjects belong to class V.

Fig 1: Study subjects were assessed for risk of diabetes using IDRS. Of 523 study subjects more than half were at medium risk (59.3%) of diabetes and one fourth of them were at high risk of diabetes (28.7%). Very few of them were at lower risk of diabetes (12.7%)

Risk of diabetes was assessed for its association with factors like habits (smoking & alcohol consumption), BMI, physical activity and family history of diabetes (**Table 2**). Significant association of diabetes risk was found with alcohol consumption and physical activity (P< 0.05). Number of study subjects who are at medium or high risk of diabetes more in the group who didn't consume alcohol and subjects who performed physical activity. There was no significant association was found between diabetes risk and BMI, smoking and family history of diabetes mellitus (P>0.05).

Table 1: Socio-demographic characteristics of study subjects

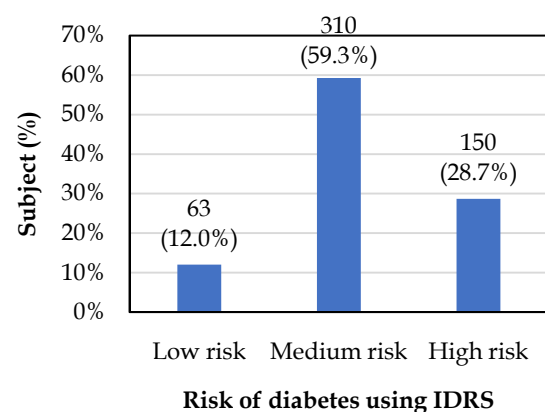| Socio-demographic characteristics	Subjects (n=523) (%)
Aga In years	
< 35	95 (18.2)
35-45	148 (28.3)
>45	280 (53.5)
Sex	
Male	250 (47.8)
Female	273 (52.2)
Religion	
Hindu	515 (98.5)
Muslim	8 (1.5)
Socio-economic status	
I	104 (19.9)
II	203 (38.8)
III	205 (39.2)
IV	11 (2.1)

Fig 1: Distribution of Study subjects according to risk of diabetes using IDRS

Table 2: Association of diabetes risk with BMI, smoking & alcohol consumption, physical activity and family history of diabetes

Variables	Risk of diabetes			
	Low risk	Medium risk	High risk	P* value
BMI#				
<25	48 (13.6)	209 (59.2)	96 (27.2)	0.44
>25	14 (8.8)	94 (58.8)	52 (32.5)	
Smoking				
Yes	07 (7.4)	64 (67.4)	24 (25.3)	0.14
No	56 (13.1)	246 (57.5)	126 (29.4)	
Alcohol				
Yes	12 (19.0)	42 166.7)	9 (14.3)	0.01
No	51 (11.1)	268 (58.3)	141 (30.7)	
Physical Activity				
Yes	63 (15.1)	279 (66.9)	75 (27.5)	<0.00
No	07 (6.9)	28 (27.5)	67 (65.6)	
Family History of DM@				
Yes	06 (6.7)	52 (57.8)	32 (35.6)	0.12
No	57 (13.2)	258 (59.6)	118 (27.3)	

*chi square test, @DM: diabetes mellitus, #BMI: Body Mass Index

DISCUSSION

IDRS is a screening tool to that is used to assess risk of diabetes in general population with sensitivity of more than 70%.[8,9] In our study more than 50% of study subjects belonged to more than 45 years age group, number of males and females were almost same, maximum belonged to hindu religion and most of them belonged to SES class II & III. Socio demographic characteristics in terms of age and gender in present study were similar to study by S. Nagalingam et. al in Tamilnadu[10].

In present study more than 50% of them belonged to medium risk of diabetes according to IDRS score and around one third belonged to high risk category. Very few were at lower risk of diabetes (12%). In a study conducted by Gupta SK et. al in urban area of Pondicherry had similar findings to our study (18.5% low risk, 50.3% medium risk and 31.8% at high risk of diabetes respectively) . This may be due to the similarity in the proportion of study subjects in different groups in our study and a study in urban area of pundicherry. A study conducted by S Nagalingam et. al also showed the prevalence of risk of diabetes using IDRS similar to our study. This may be due to similarities in the lifestyle of style subjects. Though study subjects in their study are from semi-urban area, factors that increases the risk of diabetes will be similar to the rural population. [11,12]

In a study in rural area of costal Karnataka by C Rao at. al showed more than 50% in their study subjects were at high risk of diabetes. Though there is difference in prevalence of diabetes in rural and urban areas the risk of diabetes is equally raising so is the prevalence of diabetes. [13]

In present study there was no significant association between socio demographic characteristics and risk of diabetes. The findings of the study are contrary to this a study by S. Jayakiruthiga et. al[14] showed significant association between risk of diabetes and age. This could be due the difference in the number study subjects in different age group. In their study more than 70% study subjects belonged to age group 35-50years where in our study the proportion of study subjects in age group of < 45 years and more than 45 years was almost equal. As in our study, a study in urban area of Delhi by AS Acharya[15] also showed significant association between significant association between socio demographic characteristics like education and marital status and risk of diabetes using IDRS.

Our study showed significant association between risk factors of diabetes like alcohol intake and physical activity but number of study subjects who were at risk of diabetes were among individuals who didn't consume alcoholics. There was no association found between other risk factors of diabetes like BMI, smoking and family history of diabetes. Findings of our study are similar to a study by AS Acharya.[15] Though there study showed association between risk factors of diabetes like education and occupation there was no significant association between factors like current /past alcohol intake and smoking.[15]

CONCLUSION

More than half of study subjects were at medium risk (59.3%) of diabetes and one fourth of them were at high risk of diabetes (28.7%). There was significant association between diabetes risk and physical activity & alcohol consumption. Early di-

agnosis of disease may prevent progression of disease and its complications.

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