International Journal of Advances in Medicine
Nagalingam S et al. Int J Adv Med. 2016 May;3(2):415-418
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: http://dx.doi.org/10.18203/2349-3933.ijam20161102

Research Article

Screening for diabetes using Indian diabetes risk score

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Received: 09 March 2016
Accepted: 12 April 2016

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ABSTRACT

Background: Prevalence of type 2 diabetes has escalated to beyond the projected values in many countries like India, so it becomes mandatory to screen the population to recognize the disease early. This study was carried out with the objective of screening the adult population using the pre validated MDRF-IDRS questionnaire.
Methods: This study was done among adult population as community based cross sectional study around semi urban population of Chennai near Ponamallee and Avadi. House to house survey was done and the population was randomly selected randomly among adults of more than 20 years of age and not a known diabetic patients.
Results: Our study included 304 study participants with the mean age of 41.5 years, majority 55% females, 73% belonging to nuclear family and majority were from class II socio economic status. Around 74% were non vegetarian population with smoking and alcohol habits 20% and 23% respectively. According to IDRS score of MDRF the study population were classified to be low, medium and high risk for developing type 2 diabetes were 18%, 45% and 37% respectively.
Conclusion: Our study has described that the majority of the adult population were at medium and high risk of developing type 2 diabetes which is actually a dangerous sign for the community, needing lifestyle changes to be initiated as soon as possible to delay the occurrence of type 2 diabetes.

Keywords: Type 2 diabetes, Screening, Indian diabetes risk score, BMI, Waist circumference

INTRODUCTION

Diabetes has become one of the most common non communicable diseases and its burden is on the rise among all the age groups affecting urban and rural population without urban rural differences.[1,2] The projected increase of diabetes patients has crossed beyond certain levels in such a way that every house in India has a diabetic person. In fact the projected increase by 2025 will be 70- million in India according to WHO SEARO 3 which is a huge burden to the health care facilities and also the economic burden to the people those who are going to suffer. The only way of reducing the socio economic burden of diabetes is early diagnosis by applying short questionnaire to assess the risk of developing diabetes. As the risk factors like increasing age, obesity, family history of diabetes, lack of physical activity, stressful environment and dietary habits for Type 2 Diabetes were well established, various associations and federations throughout the world has developed the risk scoring for the development of type 2 diabetes. Among these prediction tools, American Diabetes Association (ADA) Risk Tools, Finnish Diabetes Risk Score (FINDRISC), National Health and Nutrition

Examination Survey (NHANES) risk score, and study to prevent non-insulin dependents diabetes mellitus (STOP-NIDDM) Risk Score in developed countries 4 and currently in practice in India – Indian Diabetes Risk score developed by Madras Diabetes Research Foundation and Ramachandran A et al.[5,6] Almost all these questionnaires have the common risk factors with little differences according to the population race and their susceptibility and its predictive nature were all well established by many studies. This study was intended to use the IDRS risk score a screening tool for assessing the risk of developing diabetes among the semi urban community and its significance.

METHODS

The study was done as a community based cross sectional study in the semi urban area near Ponamallee and Avadi. The areas were selected randomly by simple random method and the study population was reached by approaching them directly at their houses. A house to house survey was conducted in those two areas using the simplified form of Indian Diabetes Risk Score and the general socio demographic profile was also collected along with the score.

The study tool which we have used in this study was IDRS - Indian Diabetes Risk Score - A simplified form of score for screening undiagnosed Diabetics.[5] An IDRS value > or = 60 had the optimum sensitivity (72.5 %) and specificity (60.1%) for determining undiagnosed diabetes with a positive predictive value of 17.0%, negative predictive value of 95.1%, and accuracy of 61.3%.[5]

The study tool has got four important factors like, age, abdominal obesity, family history of diabetes and physical activity. The scoring given here.

The study questionnaire also includes the measurement of body mass index, dietary habits, smoking and alcohol habits.

Outcome measures: The outcomes are expressed in percentages based on low, medium and high risk of developing diabetes using the IDRS risk score. The minimum score is 0 and the maximum score is 100.

RESULTS

Our study included 304 study participants with the mean age of 41.5 years, majority 55% females, 73% belonging to nuclear family and majority were from class II socio economic status. Around 74% were non vegetarian population with smoking and alcohol habits 20% and 23 % respectively (Table 1). According to IDRS score of MDRF the study population were classified to be low, medium and high risk for developing type 2 diabetes were 18%, 45% and 37% respectively. (Table 2 and Figure 1).

Table 3 Shows different variables used in IDRS screening questionnaire and their scoring system. Approximately 30% were more than 50 years of age, 16% had high abdominal obesity by waist circumference, 31% were having sedentary habits and 12% had family history of diabetes in both parents. According to Body Mass Index measure, the mean BMI was 25.6 among the total study population of which 142 (46%) had BMI between 25 to 29.99 and 30 (9.8%) had BMI above 30 whereas the mean IDRS score was 49.14.

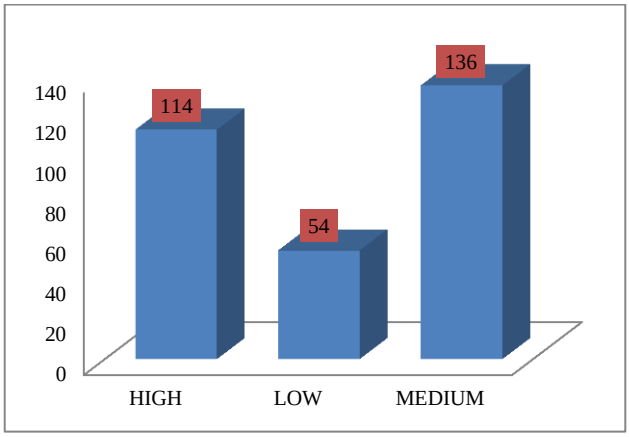

Figure 1: Bar diagram representing risk of developing diabetes.

Table 1: Distribution of study participants and its varibles.

Variables	Frequency	Percentages
Gender		
Male	138	45%
Female	166	55%
Family Type		
Joint	82	27%
Nuclear	222	73%
Socio-Economic Status		
Class I	118	38.8%
Class Ii	102	33.6%
Class Iii	56	18.4%
Class Iv	26	8.6%
Class V	2	0.7%
Diet		
Non-Vegetarian	226	74.3%
Vegetarian	78	25.7%
H/O Smoking		
No	244	80.3%
Yes	60	19.7%
H/O Alcohol		
No	234	77%
Yes	70	23%

Table 2: Risk of development of diabetes based on IDRS score.

Risk		
High	114	37.5%
Low	54	17.8%
Medium	136	44.7%

Table 3: Scoring system of IDRS among study population.

Variable	Frequency	Percentage
Age		
0	116	38.2%
20	98	32.2%
30	90	29.6%
Waist		
0	122	40.1%
10	134	44.1%
20	48	15.8%
Physical activity		
10	14	4.6%
20	196	64.5%
30	94	30.9%
Family history		
0	228	75%
10	40	13.2%
20	36	11.8%

DISCUSSION

Although many screening questionnaires developed by various diabetes associations throughout the world, certain screening tools vary according to the ethnic groups. One such clear and easily usable tool developed by MDRF by Mohan Vutilizing the very simple risk factors like age, waist circumference, physical activity and family history. Almost all the screening questionnaires include the risk factors like, age and weight. This IDRS is unique in a way that having family history and the physical activity and measurement of waist circumference as a measure of abdominal obesity. This plays a very important role in determining the role of developing type 2 diabetes because Indian population is characteristic of type 2 diabetes with lean BMI. So instead of BMI, the utilization of Waist circumference in the screening makes it a better screening tool for assessing type 2 diabetes, whereas the Finnish group diabetes risk score has included both BMI and waist circumference. The IDRS has a sensitivity of 72.5% and specificity of 60.1% and is derived based on the largest population based study on diabetes in India CURES. The advantage of IDRS are its simplicity, low cost and is easily applicable for mass screening programmes. IDRS should be tested in other population based studies in India both rural and urban. Of course many studies were done in India validating the IDRS score done by Anandh Vardhan et al among medical students, Lanord Stanley JM et al study among rural community in Tamil Nadu, Adhikari P et al among South Indian population.[7-9] All these validation studies accepts that the MDRF - IDRS predicts diabetes but also identified those with metabolic syndrome and cardiovascular disease. Hence this tool may be useful for motivating people for primary prevention of diabetes, metabolic syndrome and cardiovascular disease.

CONCLUSION

In conclusion, the MDRF - Indian diabetes risk score (MDRF - IDRS) is a useful tool for predicting and screening for undiagnosed diabetes mellitus in the population. Our study has described that the majority of the adult population were at medium and high risk of developing type 2 diabetes, showing the need lifestyle changes to be initiated as soon as possible to delay the occurrence of type 2 diabetes.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Nagalingam S, Sundaramoorthy K, Arumugam B. Screening for diabetes using Indian diabetes risk score. Int J Adv Med 2016;3:415-8.