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Risk of developing diabetes in the Indian youth: An evaluation using Indian diabetes risk score (IDRS)

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Abstract

Background: Prevalence of type 2 diabetes mellitus (T2DM) has increased beyond the proposed value in India; hence it is very necessary to screen population to recognize T2DM patients earlier to prevent associated complications.

Aims and objective: To evaluate and spread the awareness regarding risk for type 2 diabetes mellitus using Indian Diabetes Risk Score (IDRS)

Materials and Methods: A cross sectional study on 100 students having age between 18-25 years of either sex was performed on students of Madhav Institute of Technology and Science (MITS), Gwalior. Age, sex, waist circumference, details of physical activities and family history of diabetes were recorded by giving a questionnaire to each student. All the participants were assessed using pre-validated IDRS questionnaire based on that risk was calculated as high (≥60), moderate (30-50) and low risk (<30.)

Results: Male predominance was observed (76%) in present study. Out of 100 subjects among male, 56 (73.68%) and 20 (26.31%) has moderate and low risk for developing diabetes mellitus whereas all the females of study cohort have moderate risk of developing diabetes. None of subject had high risk of diabetes development.

Conclusion: IDRS is an effective tool to screen high risk individual in order to design strategies for future prevention and delay type 2 diabetes mellitus onset.

Keywords: type 2 diabetes mellitus, prediabetes, risk score

Introduction

Diabetes mellitus was once considered the disease of old age but now it is so common among all age groups that now being diagnosed in adolescent and even children. Individual with impaired fasting glucose (fasting blood glucose between 100 to 125 mg/dl) and/or impair glucose tolerance (2 hour oral glucose tolerance test value between 140 to 199 mg/dl) is considered as prediabetes [1]. Such patients are at high risk for developing diabetes mellitus in near future. According to international diabetes federation 11% individual with prediabetes develop type 2 diabetes mellitus every year.

In Indian individual's diabetes mellitus is diagnosed almost a decade earlier than in western population. Moreover, the treatment cost of diabetes mellitus in an economically week family may utilize as much as 25% of the entire income of each individual with diabetes. But prediabetes is a reversible condition [2].

The Indian Diabetes Risk Score (IDRS) was devised by the Madras Diabetes Research Foundation. It is an effective diabetes screening tool which takes in to account of family history, waist circumference, age and physical activity of the individual [3]. Hence, individual with high risk of developing diabetes mellitus in near future can be identified and systematic counseling and further interventions can be applied in order to reduce diabetes related complications [4].

The present study was done to evaluate and spread the awareness regarding risk for type 2 diabetes mellitus using IDRS of MITS College, Gwalior having age group 18-25 yrs.

Materials and Methods

Present cross sectional study was done on 100 subjects at Madhav Institute of Technology and Science (MITS), Gwalior, from November 2013 to January 2014. The present research protocol is approved by the College Ethical Committee and written informed consent from each participant was obtained before starting study.

In anthropometric measurement waist circumference (that indicates both central as well as general obesity) was measured using measuring tape. Measurements of the waist was done directly on the body with light clothing with accuracy of 0.5 cm. Waist circumference was taken at the midpoint between the iliac crest and the lower border of the ribs after a normal expiration.

Students having age between 18-25 years of either sex and those who have given written informed consent were included in the present study. Established cases of diabetes mellitus, subjects with hypertension, coronary heart disease, thyroid abnormality and administration of corticosteroid were excluded from the present study.

The intention of the study was thoroughly explained to each participant. All the participants were assessed for IDRS which needs answers for three questions and waist measurement.

Scores to all the subjects were awarded based n their physical activity viz. sedentary, mild, moderate, vigorous exercise or strenuous work. Other parameters were also assessed based on table 1. Risk Interpretation was done as high, moderate and low risk if their IDRS score is ≥60, 30-50 and <30 respectively.

Table 1: Indian Diabetes Risk Score (IDRS)

Particulars	Score
Age (years)	
< 35	0
35 – 49	20
≥ 50	30
Abdominal obesity	
Waist <80 cm [female], <90 [male]	0
Waist ≥ 80 – 89 cm [female], ≥ 90 – 99 cm [male]	10
Waist ≥90 cm [female], ≥ 100 cm [male]	20
Physical activity	
Exercise [regular] + strenuous work	0
Exercise [regular] or strenuous work	20
No exercise and sedentary work	30
Family history	
No family history	0
Either parent	10
Both parents	20

Taken from Patel *et al.* (Patel *et al.* 2015)

Results

Out of 100 subjects, 76% were male and 24% were female.

Table 2: Distribution of students according to waist circumference

Sex	A	B	C	Total
Male	70 (92.10)	4 (5.26)	2 (2.63)	76 (100)
Female	18 (75)	6 (25)	0 (0)	24 (100)

Data is expressed as no of subjects (%), A= < 80 cm (Female), <90 cm (Males), B=80-89 cm (Females), 90-99 cm (Males), C=>90 cm (Females), >100 cm (Males)

Out of 100 subjects, 24% male did regular physical exercise in their daily routine life, 74% did not follow regular physical exercise. None of the female subjects followed regular physical exercise. Eighty four percent subjects has no family history of diabetes, 14% had one parent family history whereas none of the subjects had two parent family histories.

Table 3: Distribution of students with IDRS score

Sex	<30 (low risk)	30-50 (moderate risk)	≥60 (high risk)	Total
Male	20 (26.31)	56 (73.68)	0 (0)	76
Female	0 (0)	24 (100)	0 (0)	24

Data is expressed as no of subjects (%)

In present study, prevalence of subjects at moderate risk of developing type 2 diabetes mellitus in future whereas prevalence of low risk was 20%. None of the subjects were found to have high risk of type 2 development. All the subjects with family history of diabetes mellitus were found to be at moderate risk for developing type 2 diabetes mellitus.

Discussion

IDRS is simple and cost effective screening tool for which is widely used by a primary care physician or healthy worker to identify the risk of developing diabetes mellitus [5, 6]. Sensitivity and specificity of IDRS as reported by Sharma et al and Stanely *et al.* is 72.5 and 60.1% respectively [7, 8].

Shobha *et al.* assessed the risk of developing T2DM using IDRS in 216 subjects having age between 20-40 years reported that risk of T2DM development increases with age in all risk score groups [6]. Prevalence of risk reported by Shobha *et al.* was 24%, 56% and 16% as high, moderate and low respectively which is in accordance with the present study where most of the subjects had moderate risk.

Anjana *et al.* studied role of parental history of T2DM in Asian Indian adolescents and reported that family history of subjects itself increase the risk of T2DM development by 4-6 times [9]. Hence, subjects' family history along with other risk factors of IDRS can put the individual at high risk of developing T2DM. Since family history is one of the non modifiable risk factor, attempts should be made to reduce weight and intense exercise. This can be an important strategy for preventing T2DM development.

Sharma et also analysed data of 8747 subjects records to study IDRS to distinguish T2DM from non-T2DM concluded that IDRS is a simple and cost effective risk assessment tool which can aid in distinguishing T2DM from non-T2DM among clinic patients in India [7].

Nagalingam *et al.* conducted a house to house survey in Chennai and out of that randomly chosen not known diabetic adults having age more than 20 years were studied. Nagalingam *et al.* reported 18%, 45% and 37% adults had low, medium and high risk for developing T2DM respectively according to IDRS score which is in accordance to present study data [10]. Present study had few limitations such as sample size was small and was focusing only single centre.

Conclusion

Each individual having age ≥18 years should be assessed for the risk of developing diabetes mellitus by calculating the IDRS to identify future risk of T2DM. It will not just aid in early detection and prevention of complications but will also reduced morbidity and mortality caused by T2DM.Hence IDRS can be used to motivate people for primary prevention of diabetes, metabolic syndrome and cardiovascular disease.

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