ORIGINAL ARTICLE

Diabetes Risk Score in Indian Population: Experience from Central India

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ABSTRACT

Introduction: Diabetes is a major health problem in the world causing significant morbidity and mortality. Currently, 77 million people in India and 463 million people are living with diabetes across the world, and this number is expected to rise to 101 million in India and 578 million globally by 2030. The key to reduce the morbidity and mortality is early diagnosis and management. The Madras Diabetes Research Foundation (MDRF) has developed an Indian Diabetes Risk Score (IDRS) to identify people who are at risk of developing diabetes or are undiagnosed. Thus, we conducted a study to calculate the IDRS of people from Central India and identify those who are at risk of getting diabetes. **Methods:** A total of 1,500 patients or attendants, aged 18 to 60 years (mean age 41.2 years), visiting the Endocrinology clinic, and not diagnosed with diabetes earlier were included in the study after taking proper consent and IDRS was calculated. **Results:** The male-to-female ratio was 914:586. The mean IDRS was 51.29 in our population with 35.93%, 18.2% and 45.87% of screened subjects having a score of <30, 30-60 and ≥60, respectively. **Conclusion:** Forty-five percent people of the population was at high risk of diabetes as estimated by IDRS, which proved to be an effective and economical tool to identify persons at increased risk of diabetes and diagnose the undiagnosed cases and start early management to reduce the morbidity and mortality.

Keywords: Diabetes, Indian Diabetes Risk Score, Madras Diabetes Research Foundation

Diabetes is a major health problem in the world leading to considerable morbidity and mortality. Prevalence of diabetes is expected to rise exponentially, currently 77 million people in India and 463 million people are living with diabetes across the world, and this number is expected to rise to 101 million in India and 578 million globally by 2030 which could mostly be attributed to unhealthy lifestyle, increasing life expectancy, illiteracy, lack of awareness and low socioeconomic status.[1] The key to reducing the morbidity and mortality is early diagnosis and management. The Madras Diabetes Research Foundation (MDRF) has developed an Indian Diabetes Risk Score (IDRS) to identify people who are at risk of developing type 2 diabetes or are yet undiagnosed.[2]

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Thus, we conducted a study to calculate the IDRS of people from Central India and identify those who are at risk of getting diabetes or those who are not diagnosed with diabetes using IDRS.

MATERIAL AND METHODS

This was an observational cross-sectional study conducted at our Endocrine Outpatient Department (OPD).

All patients or attendants visiting the Endocrinology OPD, willing and not diagnosed with diabetes earlier were included in the study after taking proper informed consent. Patients who were critically ill, pregnant, had history of diabetes or not willing to participate in the study were excluded.

A total of 1,500 volunteers were enrolled who met the inclusion criteria and IDRS was calculated as described in Table 1. We also recorded the random capillary glucose levels with glucometer and correlated it with IDRS. Glucometer reading of more than 140 mg/dL was considered deranged.

RESULTS

One thousand five hundred volunteers, aged between 18 and 60 years (mean age 41.2 years) were included in the study. The male-to-female ratio was 914:586.

Table 1. Prevalence of Various Risk Factors in Our Study Population

	Score	Male (n = 914)	Female (n = 586)	Total (n = 1,500)
Age (years)				
<35	0	281	207	488
35-49	20	343	224	567
≥50	30	290	155	445
Abdominal obesity				
Waist circumference (cm)				
<80 Female, <90 Male	0	401	145	546
80-89 Female, 90-99 Male	10	348	237	585
>90 Female, >100 Male	20	165	204	369
Physical activity				
Exercise (Regular) + Strenuous exercise	0	121	86	207
Exercise (Moderate)	10	387	149	536
Exercise (Mild)	20	147	291	438
No	30	259	60	319
Family history of diabetes				
No	0	134	175	309
1 Parent	10	568	281	849
Both parent	20	212	130	342
Maximum score	**100**	**51.25**	**51.37**	**51.29**

Table 2. Distribution of the Study Population According to the Risk Score

Score	Male (%)	Female (%)	Total (%)
<30	326 (35.76)	213 (36.34)	539 (35.93)
30-60	161 (17.62)	112 (19.11)	273 (18.20)
≥60	427 (46.72)	261 (44.45)	688 (45.87)
Total	**914**	**586**	**1,500 (100)**

Table 3. Correlation Between IDRS and Deranged Blood Glucose Profile

Score	N (%)	Deranged blood glucose (RBS >140 mg/dL or FBS >100 mg/dL with glucometer [% of cases])
<30 (Low)	539 (35.93)	7 (1.29)
30-60 (Moderate)	273 (18.20)	23 (8.42)
≥60 (High)	688 (45.87)	268 (38.95)

The mean IDRS in our study population was 51.29. Details of various risk factors are described in Table 1. And, 35.93%, 18.2% and 45.87% of the screened volunteers had a score of <30, 30-60 and ≥60, respectively (Table 2).

Seven (1.29%), 23 (8.42%), 268 (38.95%) volunteers were identified with deranged blood glucose levels with IDRS of <30, 30-60 and ≥60, respectively (Table 3).

DISCUSSION

Diabetes is a major health problem in the world. Early diagnosis and management can reduce the associated morbidity and mortality by preventing complications related to diabetes. There is a perceived need for a tool, which is not only economical but also socially acceptable and reliable to identify persons at risk of diabetes. MDRF has developed the IDRS, which has all the above-mentioned qualities to identify people who are at risk of developing diabetes or are undiagnosed type 2 diabetes. IDRS identified people as low-risk, moderate-risk or high-risk if score was <30, 30-60 or ≥60, respectively.

Hence, we calculated the IDRS in our population and identified the prevalence of various components of

IDRS and correlated it with glucometer readings for capillary glucose levels.

In our study, the mean IDRS was 51.29 suggesting that our population is at moderate-risk for diabetes; 35.93%, 18.2% and 45.87% of screened volunteers had a score of <30, 30-60 and ≥60, respectively.

Nandeshwar et al in their study in 2010 identified 2.80% subjects as low-risk, 28.40% as moderate-risk and 68.80% as high-risk as per the IDRS.[3] This increase in low- to moderate-risk group and decrease in high-risk group population may be because of increasing awareness among people regarding diabetes and its complications due to several awareness programs and activities conducted by medical fraternity.

Seven (1.29%), 23 (8.42%), 268 (38.95%) volunteers were identified with deranged blood glucose levels with IDRS of <30, 30-60 and ≥60, respectively. Our findings were also in concordance with those of Mohan et al, which suggested that only 43% population with IDRS ≥60 need to be screened for diabetes, which will help in significant reduction in financial burden.[2]

CONCLUSION

Forty-five percent people of our population is at high risk of diabetes as estimated by IDRS, which is an effective and economical tool to identify the people who are at increased risk of diabetes and diagnose undiagnosed people with diabetes.

Thus, we recommend regular use of IDRS to identify people at increased risk of diabetes and screen them for diabetes and its complications to start early management and reducethe diabetes-related morbidity and mortality.

LIMITATION OF STUDY

Possibility of sample bias cannot be ruled out as volunteers were from single tertiary care center.

Conflict of Interest

Declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

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Aspirin are Preventive Drug in People with a High Risk of Strokes and Heart Attack

According to a study published in the journal *The Lancet*, the risk of stomach bleeding caused by long-term aspirin use can be decreased with a brief course of antibiotics. Aspirin is known as a useful preventative drug in low doses for people at high risk of strokes or heart attacks; however, on rare occasions, it can provoke internal ulcer bleeding.

Earlier, the findings of the HEAT (*Helicobacter pylori* Eradication Aspirin) trial led by Dr (Prof) Chris Hawkey from the University of Nottingham revealed that aspirin can cause ulcers in the stomach caused by a particular type of bacteria, *H. pylori*, to bleed by thinning the blood.

On the other hand, the findings of the recent "STAR" (Simple Trials for Academic Research) trial showed that ulcer bleeding can be significantly reduced following a 1-week course of antibiotics. In the study, more than 30,000 patients were enrolled and randomly assigned to receive antibiotics or placebos. These participants were followed for up to 7 years.

The study results showed that over the first 2½ years, only 6% of the participants who received antibiotic treatment were admitted to the hospital because of ulcer bleeding, in comparison to 17% of the patients who received dummy tablets. Similarly, in the group that received the dummy drug, the first hospitalization for ulcer bleeding occurred after 6 days in comparison to 525 days following antibiotic treatment. (*Source: https://www.tribuneindia.com/news/health/study-finds-how-regular-aspirin-use-can-cause-stomach-bleeding-448021*)

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