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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/16207

DOI URL: <http://dx.doi.org/10.21474/IJAR01/16207>



RESEARCH ARTICLE

RISK ASSESSMENT OF DIABETES USING INDIAN DIABETES RISK SCORE IN NON DIABETIC INDIVIDUALS

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Manuscript Info

Manuscript History

Received: 30 November 2022

Final Accepted: 31 December 2022

Published: January 2023

Key words:-

Determinants, diabetes, risk, screening, T2DM, IDRS

Abstract

Background and Objectives: Diabetes has emerged as a major health challenge in India due to a rapid rise in the number of diabetes cases. Early identification of high risk individuals through screening and early interventions in the form of lifestyle modifications and treatment would help in the prevention of diabetes and its complications. This study was done to assess the risk of type 2 diabetes mellitus (T2DM) in an urban slum population using the Indian Diabetes Risk Score (IDRS) and to determine the factors associated with high risk score.

Methods: A cross-sectional study was conducted among Department of Gen. Medicine Sri Aurobindo Medical College and Post Graduate Institute, Indore (18 Months). With the institutional ethical committee's permission. A total of 100 study participants were selected randomly. A pre-designed and pre-tested structured questionnaire was used for data collection. Assessment of risk of T2DM was done using the IDRS.

Results: Of the 100 study participants, 74% were at high risk (IDRS ≥ 60) followed by 24% at moderate risk (IDRS 30-50) and 2% at low risk (IDRS < 30). 45 individuals in the age group ≥ 50 yr were at high risk compared to 25 in 35-49 yr age group. Most (n=25, 87.5%) of sedentary workers were at high risk compared to those employed in moderate (n=38, 75.4%) and strenuous work (n=10, 51.9%).

Interpretation & Conclusions: 74.3 percent of study participants were high-risk for T2DM. High-risk IDRS scores were associated with age, occupation, abdominal obesity, general obesity, and high blood pressure.

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Introduction:-

Approximately 463 million adults worldwide, or 9.3% of all adults, have diabetes [1]. The number of diabetes cases in India is second only to China in the world. More than half of people with diabetes are still ignorant of their condition,[2] which makes treatment more difficult and increases the risk of complications. Among the biggest obstacles are low diabetes awareness[3], and poor management compliance[4]. The main causes of the surge in diabetes cases in India include genetic predisposition, fast food culture, and sedentary lifestyle[5]. Early interventions and the identification of high risk individuals would aid in the prevention of diabetes and its consequences. [6]. The Indian Diabetes Risk Score (IDRS)[7] is a straightforward and affordable technique for community-wide early diagnosis of undiagnosed patients. According to a recent World Health Organization

estimate, India is home to more than 19% of the world's diabetics. [8] This corresponds to more than 35 million diabetes individuals, and by 2030, it is anticipated that this figure would reach about 80 million. A large health burden brought on by diabetes is predicted by this developing trend[9,10] in India. Unfortunately, more than 50% of Indians with diabetes are still uninformed of their condition, which increases the burden of the disease. [11] This emphasises the necessity of widespread screening and awareness campaigns to detect and lessen India's diabetes burden. The Indian government has already started a national diabetes control programme, and it soon plans to launch a programme to prevent diabetes. Finding affordable techniques to discover undiagnosed diabetic subjects in our nation is crucial for the success of such programmes. Therefore, the current study was conducted to evaluate the population's risk of type 2 diabetes mellitus (T2DM) using IDRS and to identify the characteristics linked to a high risk score.

Material and Methods:-

Between April 1, 2021, and September 30, 2022, a cross-sectional study was carried out at the Department of General Medicine, Sri Aurobindo Medical College and Post Graduate Institute, Indore (18 months). with the institutional ethical committee's permission. Every patient who met the inclusion requirements was included in the trial. Written informed consent was obtained. Data were gathered using a standardised questionnaire that had been previously created and evaluated. The information included sociodemographic factors, IDRS-related factors, blood pressure (BP) measurements, and body mass index measurements (BMI). Following are the IDRS component scores: abdominal obesity (waist circumference): 80 cm in females and 90 cm in males; age: 35 yr (0 score), 35-49 yr (20 score), and 50 yr (30 score).

Results:-

A total of 100 individuals were assessed for the risk of T2DM using IDRS. The socio-demographic characteristics of the participants are as shown in Table I. The mean age of the individuals was 51.20 ± 15.11 yr [median=60, range=30-90 yr] and the male/female ratio was 72:100. Majority (n=74, 74.3%) were at a high risk of developing T2DM followed by 23.5 per cent (n=24) at moderate risk. Only three (2.2%) were at low risk. Majority of individuals (n=62, 92.5%) of age group ≥ 50 yr were at high risk compared to 35-49 yr (n=34, 63%; $P < 0.001$). More females (79.7%) as compared to males (66.7%) were at high risk of diabetes ($P < 0.08$). No significant association was noted between education and risk of diabetes. In the present study, 87.5 per cent individuals with sedentary work were at high risk compared to those in moderate (75.4%) and strenuous work (51.9%) ($P < 0.01$) (Table I). Individuals belonging to socio- economic class I and V (83.3% each) were at high risk of developing T2DM. In the present study, 79.4 per cent of the individuals with a family history of diabetes and 72.5 per cent with no family history were at high risk.

Table I:- Socio-demographic factors and the risk of type 2 diabetes mellitus by Indian Diabetes Risk Score (IDRS).

Socio-demographic factors	≥ 60 (n=74), n (%)	IDRS 30-50 and <30 (n=26), n (%)	Total (n=100)	P
Age group (yr)				
<35	4 (33.3)	7 (66.7)	11	<0.001
35-49	25 (63)	15 (37)	40	
≥ 50	45 (92.5)	4 (7.5)	49	
Gender				
Male	28 (66.7)	14 (33.3)	42	0.08
Female	46 (79.7)	12 (20.3)	58	
Education				
Illiterate	22 (80.5)	5 (19.4)	27	0.50
Primary	4 (100)	0 (0)	4	
Middle school	12 (68)	6 (32)	18	
High school	8 (73.3)	3 (26.7)	11	
Intermediate/graduate	28(70.9)	12 (29.1)	40	
Occupation				
Sedentary	25 (87.5)	4 (12.5)	29	<0.01
Moderate	38 (75.4)	13 (24.6)	51	
Strenuous	10 (51.9)	10 (48.1)	20	

Socio-economic status				
Class I	11 (83.3)	3 (16.7)	13	0.52
Class II	20 (79.4)	5 (20.6)	25	
Class III	18 (67.6)	9 (32.4)	27	
Class IV	18 (68.6)	8 (31.4)	26	
Class V	7 (83.3)	2 (16.7)	9	
Family history of diabetes mellitus				
Yes	20 (79.4)	5 (20.6)	25	0.42
No	60 (72.5)	15 (27.5)	75	

Individuals in the high risk category had a greater mean age than those in the moderate and low risk categories (P 0.001). Similar to this, people in the high risk category had significantly higher mean systolic (P0.05) and diastolic (P0.05) blood pressure (Table II).. Both men and women in the high risk group had significantly larger mean waist circumferences (P 0.001 and P 0.002, respectively).

Table II:- Comparison of mean age, blood pressure and waist circumference in various Indian Diabetes Risk Score (IDRS) categories.

Variables	IDRS, mean±SD			P
	High score (n=74)	Medium score (n=24)	Low score (n=2)	
Age (yr)	54.85±14.49	41.06±12.12	36.00±7.93	<0.001
Systolic BP (mm Hg)	131.46±18.59	123.75±15.04	108.66±12.05	<0.05
Diastolic BP (mm Hg)	83.57±11.79	78.43±10.29	72.00±3.46	<0.05
Waist circumference male (cm)	95.21±10.49	81.82±10.42	78.50±10.60	<0.001
Waist circumference female (cm)	91.07±12.10	78.66±8.88	69.00±0.00	<0.001

Discussion:-

These findings were comparable to those of a study carried out in Pune[12] Males had a higher prevalence of high risk of diabetes (66.7%) than did females (79.7%; P=0.08). Another study from northern India found no connection between gender and risk score.[13] Education and the likelihood of developing diabetes were not shown to be significantly correlated. However, Patil et al.[12] found a substantial correlation between high risk status and low education. In the current survey, sedentary workers made up 87.5% of the population, while moderate and vigorous workers made up 75.4% and 51.9% of the population, respectively (Table I). Socioeconomic classes I and V members (83.3% each) had a higher chance of having T2DM. According to a study[14], the lower-middle class has a higher risk. Similar to a previous study[12], 79.4% of those in the current study who had a family history of diabetes and 72.5% of those without one were at high risk. Individuals in the high risk category had a greater mean age than those in the moderate and low risk categories (P 0.001). Similar to this, people in the high risk category had significantly higher mean systolic (P0.05) and diastolic (P0.05) blood pressure (Table II). In a study[15], co-morbid hypertension was present in 44.9% of diabetics. Men and women in the high risk group had considerably larger mean waist circumferences than the general population, indicating a higher chance of developing diabetes as previously reported[16]. A significant flaw in the study was the tiny sample size brought on by schedule constraints.

Conclusion:-

The IDRS risk score for approximately three-fourths (74.3%) of the research subjects was >60. The risk factors that were strongly linked to a high risk score included age, profession type, abdominal obesity, general obesity, and high blood pressure. At the community level, significant information, education, and communication activities would be necessary for diabetes prevention.

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