ORIGINAL RESEARCH PAPER

Community Medicine

KEY WORDS:

A STUDY OF RISK ASSESSMENT OF DIABETES AMONG YOUNG MEDICAL STUDENTS USING FINNISH DIABETES RISK SCORE

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INTRODUCTION

Since diabetes among young people is now developing at an epidemic rate, it is necessary to identify risk factors among young people. This suggests that a significant fraction of people will experience morbidity and mortality from diabetes at a young age.

Diabetes mellitus (DM), an alarming global public health problem, is a disorder of glucose metabolism that adversely affects the well-being of those who have it as well as their families, societies, and wider populations[1]. According to the International Diabetes Federation, 537 million people worldwide have diabetes. The total number of people with diabetes is predicted to rise to 643 million (1 in 9 adults) by 2030 and 783 million (1 in 8 adults) by 2045[2].

Since diabetes is associated with several comorbidities, the recommendations for individuals with diabetes include a healthy lifestyle (diet and exercise) and maintaining HbA1c levels below 7.0%. Diabetes-related complications are directly proportional to the levels of HbA1c – the increase in the HbA1c levels also increases the risk of such complications.

Diabetes is a metabolic disorder characterized by hyperglycemia, glycosuria, hyperlipidemia, negative nitrogen balance, and sometimes ketonemia[3]. This metabolic disorder occurs when there is decreased synthesis of insulin (Type-I diabetes) or decreased utilization of insulin (Type-II diabetes)[4].

According to reports, diabetes mellitus cases are developing at younger ages in India, and the age range of 25–34 can be seen as a tipping point for the disease's prevalence[5]. The factors such as more adiposity of the abdomen, more circumference of the waist, and lower body mass index (BMI) are characteristics of the "Asian Indian Phenotype," and this makes the Indians more vulnerable to diabetes and diabetes-related complications[6].

In India, diabetes mellitus is reaching an epidemic proportion[7]. It is estimated that India is home to around 101.0 million cases of diabetes by 2030 the number is set to increase to 134.2 million by 2045[8].

The prevalence of diabetes in India is 8.3%, and the proportion of undiagnosed diabetes (20–79 years) was 53.1%. India accounts for 1 in 7 of all adults living with diabetes in the world, and diabetes caused 647,831 fatalities[2]. WHO has reported a prevalence of 8.5% worldwide among individuals older than 18 years of age[9].

Individuals known to have diabetes represent the tip of the iceberg, as an equal or even larger number of patients have undiagnosed diabetes. Unfortunately, >50% of people with diabetes in India remain undiagnosed[10]. These individuals are at increased risk for developing diabetic complications. The ICMR-INDIAB (ICMR-India Diabetes)[11] study reported that the ratio of undiagnosed to diagnosed diabetes is higher in rural compared with urban areas. Thus, if diabetes is not detected early and treated adequately, there is a high risk for developing both macrovascular (CAD, cerebrovascular, and/or PVD) and microvascular disease (retinopathy, nephropathy, and neuropathy)

Addressing these risk factors early on is pivotal both for individual health and larger public health objectives. This underpins the importance of risk assessment, particularly to instigate lifestyle changes in the younger generation who might be at potential risk[12]. To craft effective interventions, there is a need to fully understand and address the prevalence of these risk factors among young adults. However, there is a major gap in awareness; many young individuals are unaware of the risks, leading to a potential underestimation of the problem[13]

Medical students, despite their role as future healthcare advocates, are not exempt from these risk factors. Their rigorous academic demands, unpredictable eating patterns, sedentary lifestyles, and stress can often lead them down a path of unhealthy habits. Their unique academic environment and lifestyle can indeed make them more susceptible to these risks[14]

The study tool used was based on the Finnish Diabetes Risk Score (FINDRISC) developed and designed by Lindström and Tuomilehto, from the National Institute for Health and Welfare, Helsinki, Finland and the online assessment was done using the IDF Test2 Prevent- Know Your Risk of Type 2 Diabetes tool developed based on the FINDRISC[15]

FINDRISC is a commonly used instrument, designed to screen for unidentified diabetes and to identify people with an elevated risk of developing T2DM within the next 10 years[17,18]

This tool includes eight questions on age, body mass index (BMI), waist circumference, daily activity of 30 minutes, eating of vegetables and fruits, treatment history for hypertension, history of diabetes and family history of diabetes. Scores range from 0 to 26 points. A higher score represents a higher risk of developing the disease within the next 10 years. A score of under 7 points is regarded as low risk (1:100), 7–11 points represent a slightly elevated risk (1:25), 12–14 points indicate a moderate risk (1:6), over 15 points a high risk (1:3) and over 20 points (1:2) a very high risk[19] .

Aims and Objective

To identify the prevalence of diabetes mellitus and risk

factors related to diabetes among young medical students in Maharashtra. An efficient and established tool to assess population diabetes risk is the Finnish Diabetes Risk Score.

MATERIAL AND METHODS

A cross-sectional study was conducted between June 2023 to November 2023 on 319 medical students of both sexes of DY Patil Hospital, Navi Mumbai using a questionnaire. In this study, type 2 diabetes mellitus (T2DM) risk is evaluated among young medical students using the Finnish Diabetes Risk Score and the relationship between diabetes risk and other factors is investigated.

After obtaining the institutional ethical clearance and permission from the authorities the study was conducted. For data gathering, a semi-structured self-administered questionnaire was created.

Three hundred and nineteen medical students i.e. undergraduates and interns of both sexes were enrolled for the study by convenience sampling after they were informed about the purpose of the study and the method of completing the questionnaire. The students were interviewed and their privacy and confidentiality were maintained. Informed verbal consent was taken from each participant. Those who did not give consent to participate in the study were excluded.

Participants were required to complete a questionnaire on different variables regarding age, gender, waist circumference, daily activity of 30 minutes, healthy eating habits, treatment history for hypertension, history of diabetes, and family history of diabetes and BMI.

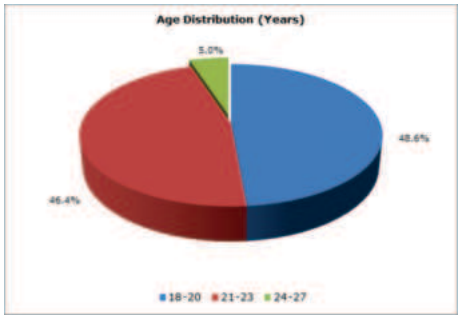
All the data were tabulated and relevant inferences were drawn. Present work includes the distribution of a prepared questionnaire, collection of responses against each question, a compilation of data in the form of tables and graphs, and interpretation of data using appropriate statistical test and conclusion.

RESULTS

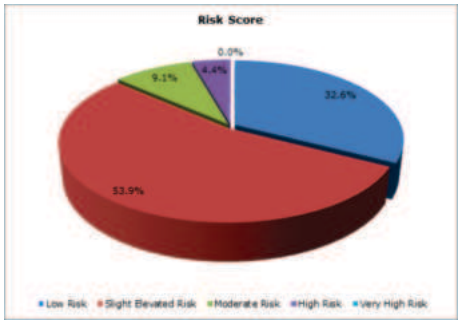
Table 1 : Baseline Characteristics

Characteristics	Frequency	%
AGE (years)		
18-20	155	48.6
21-23	148	46.4
24-27	16	5
Gender		
Male	79	24.8
Female	240	75.2
Waist circumference		
Less than 80	93	29.1
80-88	110	34.5
88-94	77	24.1
94-102	31	9.8
>102	8	2.5
Physical Activity		
Yes	235	73.7
No	84	26.3
Healthy Eating		
Everyday	213	66.8
Not Everyday	106	33.2
HTN Medication		
Yes	23	7.2
No	296	92.8
High Blood Glucose		
Yes	31	9.7
No	288	90.3
Family History of DM		
Yes: grandparents, uncle, aunt or first cousin (but no own parent, brother sister or child)	119	37.3
Yes: parent, brother, sister	99	31
No	101	31.7
Obesity (BMI)		
<18	40	12.5
18-24	203	63.7
>24	76	23.8
Risk		
Low Risk	104	32.6
Slight Elevated Risk	172	53.9
Moderate Risk	29	9.1
High Risk	14	4.4
Very High Risk	0	0

The above table shows characteristics. Maximum cases 155 (48.6%) were found in the age group of 18-20 years. Female cases were 240 (75.2%) and male were 79 (24.8). Pattern of every day healthy eating habit was found in 213 (66.8%) cases. Hypertension medication was very less in our study only 23 (7.2%) cases was observed. BMI range between 18-24 was observed in maximum cases of 203 (63.7%) cases and while calculating risk score 172 (53.9%) cases were found as slight elevated risk score.



Graph 1 : Age Distribution (years)



Graph 2 : Risk Score

Table 2 : Comparison of Association Between RISK SCORE and BMI, Daily atleast 30 min. Physical Activity, Healthy Eating Habits, HTN Medications, Blood Glucose and Family History in Study Subjects

		RISK SCORE							
		Low Risk		Slight Elevated Risk		Moderate Risk		High Risk	
		Count	% within RISK SCORE	Count	% within RISK SCORE	Count	% within RISK SCORE	Count	% within RISK SCORE
BMI	<18	25	24.00%	14	8.10%	1	3.40%	0	0.00%
	18-24	70	67.30%	115	66.90%	16	55.20%	2	14.30%
	>24	9	8.70%	43	25.00%	12	41.40%	12	85.70%
	Chi Square = 59.81 , P value = 0.001 (Significant)								

Daily atleast 30 min. physical activity	Yes	93	89.40%	124	72.10%	14	48.30%	4	28.60%
	No	11	10.60%	48	27.90%	15	51.70%	10	71.40%
	Chi Square = 37.84 , P value = 0.001 (Significant)								
Healthy Eating Habits	Everyday	75	72.10%	117	68.00%	15	51.70%	6	42.90%
	Not everyday	29	27.90%	55	32.00%	14	48.30%	8	57.10%
	Chi Square = 8.548 , P value = 0.043 (Significant)								
HTN Medication	Yes	1	1.00%	10	162	3	10.30%	9	64.30%
	No	103	99.00%	5.80%	94.20%	26	89.70%	5	35.70%
	Chi Square = 75.166 , P value = <0.05 (Significant)								
Blood Glucose	Yes	0	0.00%	6	3.50%	11	37.90%	14	100.00%
	No	104	100.00%	166	96.50%	18	62.10%	0	0.00%
	Chi Square = 175.17 , P value = <0.05 (Significant)								
Family History	Yes (Grand Parents etc)	23	22.10%	82	47.70%	12	41.40%	2	14.30%
	Yes (Parent etc)	5	4.80%	69	40.10%	15	51.70%	10	71.40%
	Chi Square = 136.34 , P value = <0.05(Significant)								

The above table shows Comparison of Association between RISK SCORE and different variables like BMI, daily atleast 30 minutes physical activity, healthy eating habits, HTN medications, blood glucose and family history in study subject. While comparing the risk score found that in 70 (67.30%) cases were in low risk score and in 12 (85.70%) cases BMI more than 24 were in the high risk score. While observing the daily atlest 30 minutes physical activity 93 (89.40%) cases were in low risk and 4 (28.60%) cases were in the high risk. Hypertension medication association between risk score was observed as yes in only one (1%) cases and no in 103 (99.00%) cases in low risk. Blood glucose association with risk score were higher in 14 (100%) cases of high risk.

DISCUSSION

Diabetes mellitus is a predominant factor in global mortality and morbidity, putting significant strain on public health systems worldwide. While the condition surfaces during adulthood, the foundation often lies in early life choices and habits. The World Health Organization has reported that non-communicable diseases account for about 31% of all global deaths, with a concerning 75% of deaths occurring in low- and middle-income countries, with diabetes being the major cause next to cardiovascular diseases[20]. A majority of these deaths can be prevented as they are primarily linked to modifiable risk factors such as tobacco use, an unhealthy diet, lack of physical activity, and excessive alcohol consumption[21]

The natural history of diabetes mellitus is such that apart from acute complications it causes dreaded chronic complications like nephropathy, retinopathy, myocardial infarction, stroke, etc. Being chronic these complications occur after several years of disease occurrence. Hence, anyone who has diabetes for a longer duration is more likely to have these complications, compared with somebody with a shorter duration of diabetes mellitus, provided diabetes control is similar. Not only this, there has been a rapid increase in the occurrence of DM at an early age[22-24].

FINDRISC is easy to use, non-invasive, inexpensive, and includes modifiable risk factors such as diet, physical activity, and body weight[25]. It is a validated risk assessment tool to predict type 2 diabetes[18].

CONCLUSION

According to the results of the current study, 11 (37.9%) were in the moderate-high risk category of developing type 2 diabetes, and health professionals should be especially watchful of young obese males who engage in little physical activity and have a strong family history of the condition. Therefore, it is vital to promote behavior change communication among young medical students so that risk-reduction measures and lifestyle modifications can be put into place during their formative years.

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