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Assessment of Risk for Type 2 Diabetes Mellitus among Adolescents in A Medical College.

Sindhu R, Vinay AV*, Vastrad BC.

Department of Physiology, PES Institute of Medical Science and Research, Kuppam, Andhra Pradesh, India.

ABSTRACT

India is second largest densely populated country in the world, and also expected to become the diabetic capital of the world by 2025. Diabetes mellitus is one of the leading causes of morbidity and mortality in developing countries. It's an iceberg disease where more than 50% of people are unaware of their diabetic status. In this study risk assessment of type 2 diabetes mellitus among first year medical students were done using a simple Indian diabetes risk score (IDRS). More than one third of the study group population belonged to Medium risk and high risk group. A positive correlation was demonstrated between body mass index and waist circumference with p value of < 0.01

Keywords: Diabetes mellitus, IDRS

*Corresponding author

INTRODUCTION

Type 2 diabetes mellitus are one of the most common non-communicable diseases prevalent in the developing countries. It's one of the leading causes for morbidity and mortality. The current prevalence of diabetic patients is around 35 million and with current rising trend it's expected to be around 80 million by 2030 [1-4]. Earlier diabetes was common in middle aged and elderly individuals, but now it's been diagnosed in all age groups, including children. Hence there is a need to sensitize the population from an early age regarding diabetes mellitus and screening of diabetes [5]. Adolescence is a critical time for young people, as the sheer amount of stress and responsibility in the competitive world for the success is high. These stressors are even more in the medical students. Thus we intended to assess the risk of type 2 Diabetes in medical students. This will help us to incorporate some of the lifestyle changes in risk population so as to have a healthier younger generation.

MATERIALS AND METHODS

The cross sectional Study was done at PES institute of medical sciences and research (PESIMSR), Kuppam, Andhra Pradesh. The study population included first year medical students studying at PESIMSR, unwilling and a known case of type 2 diabetes mellitus students were excluded from the study.

There were 146 among 150 first year medical students studying at PESIMSR, satisfied the study criterion. All subjects were assessed for IDRS (Indian diabetes risk score) developed by Dr Mohan and his colleagues, it was a semi-structured questionnaire comprising of general information, family history of diabetes and anthropometric measurements(6) Here subjects responded to three simple question regarding age, physical activity level and family history of diabetes. And waist circumference was measured. Anthropometric data like height in centimeters and weight in kilograms were measured using stadiometer and electronic weighing scale respectively. Body mass index were calculated.

Statistical analysis

The data obtained was tabulated in excel sheet and were analyzed. The scoring was done according to IDRS criterion (appendix-1).The subjects were scored with a minimum score of Zero and a maximum score of one hundred. Depending upon the score obtained the subjects were divided into three category of diabetic risk, Score ≤ 30 were low risk, score of 40-50 were medium risk, and a score ≥ 60 were high risk candidates for diabetes. The correlation between various parameters and risk was assessed.

RESULTS AND DISCUSSIONS

146 subjects participated in the study among which 53 were males and 93 were females.

All students were below the age of 18 years. Among them 51 students had increased waist circumference (table-1). 70 students did not have any physical activity (table-2). With respect to BMI 33 students were overweight and 54 were obese (table-3). 40 students had family history of diabetes (table-4). 46 students were at medium risk and 7 students were at high risk for diabetes (table-5). Mean ± standard deviations of BMI and waist circumference of the subjects are 24.27 ± 4.29 and 79.16 ± 10.44 respectively. A positive correlation was seen between the BMI and waist circumference, that is if BMI score increases by one then the waist circumference increases by 0.857 centimeters with p ≤ 0.01. Other tables of relation has been described in tables-6 to table-11

This study showed that more than one third of the study populations were at risk of diabetes mellitus. That is 46 were at medium risk and 7 were at high risk. It was notable that 34 among 54 obese subjects were at risk. 51 subjects had increased waist circumference among them 43 were at risk of diabetes. 29 out of 40 subjects were at risk that had family history of diabetes mellitus. Among 70 sedentary subjects 44 were at risk of diabetes, and it was notable that 12 subjects involved in regular moderate degree of physical activity were at low risk.

The data suggests that modifiable risk factor like BMI, Waist circumference and degree of physical activity play a major role in causation of disease. Adolescence is critical ages during which indoctrinating good

habits and life style modification can reap positive health benefits. Regular practices of yoga have produced an increase in the lean body mass and decrease in the body fat percentage [6] which subsequently reduce the BMI and waist circumference. Intake of food rich in fibers and reduction of high caloric food bring about harmony in the physiological function of the body. Adolescent people are susceptible to smoking and alcohol consumption driven by sheer curiosity and pleasure [7], which are again modifiable risk factors.

We can hope on addressing these issues of diabetes risk factors at adolescent age, can restrain the increasing trend of diabetes and have a healthy younger generation.

Appendix-1

INDIAN DIABETES RISK SCORE

Name: **Gender: male/ female**
Date of Birth: /   /19
Waist circumference:
Height: **cms**   **Weight:**   **kgs**

Particulars	Score	✓ Here
Age		
<35 years	0	
35-49 years	20	
≥ 50 years	30	
Waist circumference		
Waist < 80cm (female), <90 cm (male)	0	
Waist ≥ 80-89cm (female), ≥ 90-99 cm (male)	10	
Waist ≥ 90cm (female), ≥ 100 cm (male)	20	
Physical activity		
Vigorous exercise (regular) or strenuous (manual) activity at home/work	0	
Moderate exercise (regular) or moderate physical activity at home / work	10	
Mild exercise (regular) or mild physical activity at home/ work	20	
No exercise and sedentary activities at home/work	30	
Family history of diabetes		
No diabetes in parents	0	
One parent has diabetes	10	
Both parents have diabetes	20	
Maximum score possible	100	

Risk classification

Score	Risk	✓ here
≤ 30	Low	
40-50	Medium	
≥ 60	High	

Table 1

Waist circumference	Number	Percent
NORMAL	95	65.1
INCREASED	51	34.9
Total	146	100

Table 2

Physical activity	Number	Percent
NO EXERCISE	70	47.9
MILD EXERCISE	64	43.8
MODERATE EXERCISE	12	8.2
Total	146	100

Table 3

BMI	Number	Percent
UNDER WEIGHT	6	4.1
NORMAL	53	36.3
OVER WEIGHT	33	22.6
OBESE	54	37
Total	146	100

Table 4

Family history	Number	Percent
NO PARENT DIABETIC	106	72.6
ONE PARENT DIABETIC	35	24
BOTH PARENT DIABETIC	5	3.4
Total	146	100

Table 5

Diabetic Risk	Number	Percent
LOW RISK	93	63.7
MEDIUM RISK	46	31.5
HIGH RISK	7	4.8
Total	146	100

Table 6: Relation between gender and BMI

GENDER	BMI SCORE				Total
	UNDER WEIGHT	NORMAL	OVER WEIGHT	OBESE	
MALE	3	19	9	22	53
FEMALE	3	34	24	32	93
Total	6	53	33	54	146

Table 7: Relation between gender and risk

GENDER	RISK			Total
	LOW RISK	MEDIUM RISK	HIGH RISK	
MALE	45	5	3	53
FEMALE	48	41	4	93
Total	93	46	7	146

Table 8: Relation between BMI and risk of diabetes

BMI SCORE	RISK			Total
	LOW RISK	MEDIUM RISK	HIGH RISK	
UNDER WEIGHT	5	1	0	6
NORMAL	45	8	0	53
OVER WEIGHT	23	10	0	33
OBESE	20	27	7	54
Total	93	46	7	146

Table 9: Relation between waist circumference and diabetes

WAIST CIRCUMFERENCE	RISK			Total
	LOW RISK	MEDIUM RISK	HIGH RISK	
NORMAL	85	10	0	95
INCREASED	8	36	7	51
Total	93	46	7	146

Table 10: Relation between physical activity and risk of diabetes

PHYSICAL ACITVITY	RISK			Total
	LOW RISK	MEDIUM RISK	HIGH RISK	
NO EXERCISE	26	38	6	70
MILD EXERCISE	55	8	1	64
MODERATE EXERCISE	12	0	0	12
Total	93	46	7	146

Table 11: Relation between family history of diabetes and risk of diabetes

FAMILY H/O DM	RISK			Total
	LOW RISK	MEDIUM RISK	HIGH RISK	
NO PARENT DIABETIC	82	24	0	106
ONE PARENT DIABETIC	11	19	5	35
BOTH PARENT DIABETIC	0	3	2	5
Total	93	46	7	146

CONCLUSION

Adolescent age group is vulnerable to risk of diabetes and can be controlled by adapting healthy lifestyle.

ACKNOWLEDGEMENT

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