Original Article

The Value of the Indian Diabetes Risk Score as a Tool for Reducing the Risk of Diabetes among Indian Medical Students

Medicine Section

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ABSTRACT

Introduction: Diabetes Prevention Programme (DPP), LOOK AHEAD trial, Indian Diabetes Prevention Programme have clearly established the benefits of lifestyle interventions coupled with education in reducing diabetes and CVD risk We conducted a study on the effect MDRF-Indian Diabetes Risk Score as a motivational tool for lifestyle change with special reference to physical activity and caloric intake among medical students.

Materials and Methods: The study was conducted on 150 medical students who were given their IDRS scores and laboratory values of Fasting plasm glucose and fasting lipid profile. IDRS was recalculated after 6 months. Change in total caloric intake, duration of exercise, pedometer counts and waist circumference were recorded before and after giving them their lab reports and risk score.

Results: After conveying the IDRS and lab reports, there was a significant decline in IDRS (from 36+ 10 to 31.2+11), waist circumference (85.4+7.4 cm to 84.1+7.2), caloric intake (from 1994+154 calories to 1817+152), physical inactivity score in IDRS (from 26+4.7 to 21+3.6) with increase in pedometer counts from 4628+432 to 9410+264.

Conclusion: Calculating diabetes risk by using MDRF-IDRS improved physical activity, decreased caloric intake and waist circumference significantly among medical students and is a useful motivational tool for lifestyle change.

Key Words: IDRS, Diabetes, Medical students

INTRODUCTION

The prevalence of type-2 DM is increasing in all the populations worldwide [1]. It is a major risk factor for death and numerous non fatal complications which pose a large burden to the patients and their families. The WHO reports suggest that over 19% of the world's diabetic population resides in India. This means that currently India has 35 million diabetic subjects, the number of which is projected to rise to 80 million by the year 2030 [2]. In Diabetes Prevention Programme, a multicentre clinical research study was aimed at discovering whether life style intervention or the treatment with metformin prevents or delays the onset of diabetes was done. The life style intervention group showed a 58% reduction in the risk of diabetes as compared to a 31% risk reduction in case of the group which received metformin [3]. Look ahead trial a life style intervention, a recent multi-centre randomized clinical trial which compared the effects of intensive lifestyle intervention (ILI) and diabetes support and education DSE, control group) on the incidence of major CVD events in 5145 individuals withtype 2 diabetes, showed that the lifestyle intervention produced and maintained significant weight losses and improvements in fitness in individuals with type 2 diabetes [4]. Across four years of follow-up, those in ILI had better overall levels of glycaemic control, blood pressure, HDL-C and triglycerides and they thus spent considerable time with a lower CVD risk. The Indian Diabetes Prevention Programme also has shown similar results [5]. This emphasizes the fact that life style modifications, namely dietary changes and increased physical activity can reduce the incidence of diabetes mellitus.

The Indian Diabetes Risk score [Table/Fig-1] The Indian Diabetes Risk Score (Table/Fig-1), which was devised by the Madras Diabetes Research Foundation (MDRF) is an efficient diabetes screening tool which takes family history, waist circumference, age and physical activity into account [6].Thus, the high risk individuals can be identified by using the IDRS and by systematic counseling and intervention, it can be used as an efficient tool to reduce the risk in diabetics. A study was planned to check the value of IDRS as an educational tool for reducing the diabetes risk score among Indian medical students.

Particulars	Score
Age	
<35	0
35-49	20
>=50	30
Abdominal Obesity	
Waist <80cm (female), <90cm (male)	0
Waist ≥ 80-89cm (female), > 90-99cm (male)	20
Waist ≥ 90cm (female), ≥100cm (male)	30
Physical activity	
Exercise + strenuous work	0
Exercise or strenuous work	20
No exercise or sedentary work	30
Family history	
No family history	0
Either parent	10
Both parents	20

[Table/Fig-1]: Showing the details of MDRF – Indian Diabetes Risk Score 6

MATERIALS AND METHODS

Study setting: Kasturba Medical College, Mangalore

Study participants: Medical students who gave informed consent

Sampling method: Convenient sampling

Study Duration: 6 months

Sample size calculation: The sample size was calculated by using our a pilot study by keeping a p-value of <0.05 with a power of 90%, assuming that 40% of the students would have a moderate to high risk score. It was found to be 150.

Outcome measures: Change in total caloric intake, change in waist circumference change in duration of exercise, pedometer counts & change in the mean risk score.

Statistical analysis: Waist circumference, caloric intake, duration of exercise, the mean risk score was compared by using the paired t-test.

150 medical students (75 males and 75 females) who gave informed consent were selected and their IDRS was calculated by using a validated questionnaire which comprised of family history, dietary habits and their physical exercise details. Their waist circumference also was measured. Their fasting plasma glucose profile and lipid profile were also done. They were informed about the risk score and the lab reports. They were subdivided into high risk (risk score of 60 and above), moderate risk (risk score of 30-50) and low risk (risk score below 30) groups according to their risk scores. The moderate and the high risk groups were followed up and any change in the modifiable parameters of the risk scores was noted after 3 months.

RESULTS

Out of the 150 students who took part in our study, about 33% were in the moderate to the high risk category [Table/Fig-2]. 22% had minimal physical activity and 77% had moderate physical activity, while 1% had strenuous physical activity. About 9 % of them had an increased waist circumference, thus indicating abdominal obesity. 10% had one diabetic parent and both the parents of 2% of the students were diabetics [Table/Fig-3].

Age had no role in the risk score of this group, as all of them were well below 35 yrs, the mean age being 21 ± 2 years. After intervention, changes were observed in the modifiable parameters were as follows, there was a reduction in the mean abdominal circumference by 1.47 ± 1.14 cm. There was an increase in the physical activity as evidenced by an increase in the hours which were spent at a gymnasium and the increased number of steps as observed by the pedometer counts. There was a reduction in the mean calories by 176 ± 87 kcal in the dietary intake. All these factors contributed to the reduction of the mean risk score from 36 to 31 [Table/Fig-4].

DISCUSSION

The results of our study showed that IDRS is a useful tool to identify high risk individuals who can be targeted for the annual screening for diabetes and for dyslipidaemia screening. Our study also showed that giving the risk score to individuals changed the health behaviour of the students, as shown by the caloric reduction by nearly 200 calories, the doubling of physical activity as measured by a pedometer, a reduction in the waist circumference and a reduction in the IDRS score .Several long term lifestyle intervention studies have suggested several methods of improving the lifestyle [5-7]. Carbohydrate counting, counting the percentage weight reduction and the step count are the common methods which are adapted in various life style intervention programmes such as the diabetes prevention programme [3], the LOOK AHEAD trial and the Indian DPP study and most of them used multiple sessions of education and motivation for the first 6 months and even more expensive methods if the goals were not achieved after 6 months [5-7]. Yu et al studied the economic impact of 1% weight loss in type 2 diabetes and concluded that one year's total healthcare cost declined by 213$ per person [8]. Wolf et al evaluated the cost of 12 months of lifestyle intervention as compared to the standard care and found that the net cost per person was 328$ per year, which could be negated by lesser hospital admissions and lesser health care costs [9]. However, in the Indian DPP study, the life style interventions included a 7% weight loss, a 150 minutes activity goal/ week, fat gram counting in addition to calorie counting and tool box for meal replacement with as many as 16 sessions in the 1st 6 months, while the LOOK AHEAD trial included a 7% initial weight loss, a 175 minutes per week activity goal, a 24 group and individual sessions in the 1st 6 months,18 sessions for the 7th–12th months, caloric counting with the inclusion of fat gram counting and a portion controlled diet [5, 7] .In our study, the simple method of giving the IDRS and the lab reports helped us in achieving an increase in the physical activity and reduction in the calorics . However, the cost of doing the lipid profile and fasting blood glucose assessment for everyone would negate the benefit of the money which was spent for individual or group sessions. However, assessing the IDRS and evaluating the lipid profile and fasting blood glucose in individuals in the moderate to the high risk groups would be cost effective. Also, convincing the low risk group to prevent an increase in the

Group I	Upto30	101	20	67%
Group II	(30-50)	42	34	28%
Group III	60 and above	7	60	5%

[Table/Fig-2]: Showing No. of students on each risk group

Physical activity	N	% Study
Minimal	33	22.0
Moderate	116	77.3.
Strenuous	1	0.7
Waist circumference		
I (<80cm females & < 90cm males)	137	91.3
II (>80cm females & > 90 cm males)	11	7.3
III (> 90cm female & > 100 cm males)	2	1.3
	150	
Family history		
One parent	16	10.4
Both parent	3	2
None	131	87.6
Total		150

[Table/Fig-3]: Showing details of risk score component 150 Medicals students

Parameters	Before	After
Mean risk score	36 ± 10	31.2 ± 11
Waist circumference	85.4 ± 7.4	84.1 ± 7.2
Calorie intake	1994 ± 154 Cal	1817 ± 152 Cal
Physical activity IDRS score	26 ± 4.7	21 ± 3.6
Pedometer counts	4628 ± 432	9410 ± 264

[Table/Fig-4]: Effect of intervention on modifiable parameters

waist circumference and to maintain physical activity would be the strategy which would keep young people in the low risk category. However, our study was conducted among medical students with good knowledge. Convincing the non medical youth to adopt a healthy lifestyle would be more difficult. A separate study on the calculation of IDRS in multiple groups of people of various age groups and its effect on the lifestyle modifications is warranted. Our study is limited by the fact that we did not repeat the blood tests and measure the percentage weight change as in the DPP and the LOOK AHEAD trials. Future trials should be planned with strong study designs with control groups.

CONCLUSION

Calculating the IDRS and motivating the high risk people to undergo fasting blood glucose and lipid profile assessment helps them to modify their life styles. Our study also showed that the risk score alone did not motivate the group. Abnormal lab reports (mainly the lipid profile) along with the risk score made them to believe the risk score. Hence, we recommend that every individual above 20 years should be assessed for the risk of developing diabetes by calculating the IDRS and those with a moderate to high risk score must have their fasting blood sugar and lipid profile assessed annually, which could motivate them to adhere to life style changes.

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