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Physiology

Assessment of Indian Diabetes Risk Score in Pune urban population.

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ABSTRACT **Background:** The rising prevalence of type 2 D.M is closely associated with industrialization and socio economic development. Most of these people remain undiagnosed also left untreated, diabetes can lead to cardiovascular disease, blindness and kidney failure. So the purpose of the study was to evaluate risk of developing type 2 D.M in later life with the aim to evaluate the risk factors for type 2 diabetes in Pune urban population. **Material & Methods:** All volunteers 18 years and above, attending various health camps conducted in Pune urban area were included in the study. Subjects were assessed as per the IDRS tool. The IDRS is based on the sum of the score for each of the variables included in the model, i.e., age, waist circumference, physical activity and family history of diabetes and score was calculated Statistical analysis was done by using appropriate method. **Results:** It was observed that 31.6% subjects have high risk, 52.2 % have moderate risk and 18.2% have low risk of developing diabetes in future. Maximum number of subjects are having moderate risk which is major concern in planning preventive strategies. There was statistically significant difference between the score of males and females participants. Males are having higher risk for development of diabetes. **Conclusion:** Study concludes that maximum number of volunteers are in moderate risk for diabetes and males are at higher risk for development of diabetes in future.

KEYWORDS :

Introduction:

Diabetes mellitus (D.M) comprises of a group of common metabolic disorders and is characterized by a state of chronic hyperglycaemia due to defective production or action of insulin.[1] According to guidelines of American Diabetes Association (ADA), D.M. is defined as fasting blood sugar more than or equal to 126 mg/dl & post prandial glucose level more than or equal to 200 mg / dl.[2]

The rising prevalence of type 2 D.M is closely associated with industrialization and socio economic development. The recent World Health Organization report suggests that over 19% of the world's diabetic population currently resides in India. [3]. This translates to over 35 million diabetic subjects and these numbers are projected to increase to nearly 80 million by 2030. This rising trend predicts a significant health burden due to diabetes in India [2, 3]. According to the WHO report one in 10 adults has diabetes, particularly in low- and middle-income countries [3,4]

Previously type 2 diabetes was a disease of the middle-aged and elderly, but now it has recently escalated in all age groups. [5] Most of these people remain undiagnosed, although many of these cases could be treated with low-cost medications, which would significantly reduce the risk of death and disability from heart disease and stroke. Also left untreated, diabetes can lead to cardiovascular disease, blindness and kidney failure.[6,7]

Diabetes increases the risk of cardiovascular deaths and was estimated to cause 22% of coronary heart disease deaths and 16% of stroke deaths.[4] This underscores the need for screening programmes and awareness to detect diabetes at an early stage. Screening of diabetes can be done by simple and cost effective tool like Indian Diabetes Risk Score (IDRS). The Diabetes risk score is developed by using Indian Diabetes risk score(IDRS) [8] which has been successfully implemented as a practical screening tool to assess the diabetes risk and to detect undiagnosed type 2 diabetes. It identifies individuals at risk of development of diabetes mellitus.

Therefore, in this study, we have used the common modifiable risk factors like obesity and physical activity and non modifiable risk factors like family history of diabetes to evaluate risk of developing type 2 D.M in later life with the aim to evaluate the risk factors for type 2 diabetes in Pune urban population.

Material & Methods:

It was a cross sectional study. All volunteers 18 years and above, attending various health camps conducted in Pune urban area were included in the study. Nature of the study was explained to all the subjects & written consent was taken. Subjects were assessed as per the IDRS tool.

Table : 1

Indian Diabetes Risk Score [IDRS]

Particulars	Score
Age [years]	
< 35 [reference]	0
35 - 49	20
≥ 50	30
Abdominal obesity	
Waist <80 cm [female] , <90 [male] [reference]	0
Waist ≥ 80 – 89 cm [female], ≥ 90 – 99 cm [male]	10
Waist ≥90 cm [female], ≥ 100 cm [male]	20
Physical activity	
Exercise [regular] + strenuous work [reference]	0
Exercise [regular] or strenuous work	20
No exercise and sedentary work	30
Family history	
No family history [reference]	0
Either parent	10
Both parents	20

All subjects were assessed for risk score as per the proforma using standard techniques. All subjects were assessed for IDRS. The IDRS is

based on the sum of the score for each of the variables included in the model, i.e., age, waist circumference, physical activity and family history of diabetes as shown in table 1.[5]. The anthropometric measurement waist circumference (that indicates both central as well as general obesity) was measured by using a measuring tape. Measurement of the waist circumference was taken directly on the body with light clothing with an accuracy of 0.5 cm. The waist circumference was taken at the midpoint between the iliac crest and the lower border of the ribs after a normal expiration.[7] We scored each of the factors in multiples of 10 for easy counting. Depending upon the score of IDRS subjects were divided into three categories as follows:

1) <30 (Low risk) ,
2) 30-50 (Moderate risk)
3) ≥ 60 (High risk)

Statistical analysis was done by using computerized 'SPSS' software version 10.

Results :

Table 1: Category wise IDRS distribution of volunteers.

IDRS score	N=500	Percentage (%)
<30 (Mild)	91	18.2
30 – 60 (Moderate)	261	52.2
>60 (Severe)	158	31.6
Total	500	100

Table 2: Comparison of IDRS according to sex in study group

Parameter	Sex				Z Value	P Value
	Male (n=223)		Female (n=277)			
	Mean	SD	Mean	SD		
IDRS	55.9	21.3	53.8	18.4	2.61	0.009*

*Statistically significant

Discussion :

As shown in table 1, it was observed that 31.6% subjects have high risk, 52.2 % have moderate risk and 18.2% have low risk of developing diabetes in future. Maximum number of subjects are having moderate risk which is major concern in planning preventive strategies. As observed in table 2, there was statistically significant difference between the score of males and females participants. Males are having higher risk for development of diabetes.

In a study conducted by Pranita et al in young adults about 4% were in the high risk and 76% in moderate risk category in young adults. [9] In a study by Prabha Adhikari et al they found 29.7 % in the high risk in urban slum population. [10]

We found 52.2 % volunteers with moderate risk which is more than half of the study population . In this score important modifiable risk factors like obesity and physical activity are involved . Therefore, prevention of obesity and promotion of physical activity can reduce the risk of diabetes in future . As long term hyperglycemia aymptomatic individuals are higher risk of developing macro vascular and micro vascular complications that cause significant morbidity and mortality among undiagnosed diabetic subjects. Hence, it is necessary to detect the large pool of undiagnosed diabetic subjects in India and offer early therapy to these individuals.

In our study there was statistically significant difference between the score of males and females participants. Males are having higher risk for development of diabetes. various studies found that males than females are diagnosed with type 2 diabetes . This change in the gender distribution of type 2 diabetes is mainly caused by a more sedentary lifestyle particularly among males, resulting in increased obesity. However, recent data have also shown that males develop diabetes at a lower degree of obesity than females. This finding support that the pathogenesis of type 2 diabetes differs between males and females. 11This sex differences in diabetes etiology may be due to differences in body fat distribution, insulin resistance, sex hormones, and blood glucose levels.

Hence early identification of the risk factors associated with diabetes and appropriate interventions aimed at preventing the onset of diabetes and its complications can be achieved by mass screening programme like IDRS. Hence, the study recommends that every individual above 18 years should be assessed by calculating the IDRS to identify future risk of type 2 D.M. Further second step of study recommends that Random Capillary Blood Glucose (RCBG) should be done in subjects with IDRS score ≥ 60 to confirm diagnosis of diabetes. RCBG ≥ 140 mg/dl are most likely to have diabetes while those above 113 mg/dl are likely to have prediabetes i.e., impaired glucose tolerance (IGT) or impaired fasting glucose (IFG). So, unnecessary investigations for identification of type 2 D.M were avoided and this definitively reduces the economic burden.

Conclusion:

Study concludes that maximum number of volunteers is in moderate risk for diabetes and males are at higher risk for development of diabetes in future.

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References:

1. K Park. Park's textbook of Preventive & Social Medicine. Diabetes Mellitus. Banarasidas Bhanot publications.18 th Edition; 2005:311-316.
2. Kasper, Braunwald, Fausi, Hauser, Longo, Jameson. Diabetes Mellitus. Harrison's Principles of Internal Medicine;Alvin C.Powers.16 th Edition. 2005; Vol.2: 2152 – 2185.
3. Global health risks: mortality and burden of disease attributable to selected major risks. Geneva, World Health Organization, 2009 http:// www. who. int/healthinfo/ global_ burden_ disease/ Global Health Risks_report_full.pdf).
4. Estimates for the year 2000 and projections for 2030. Diabetes Care 2004; 27:1047–53.
5. Wild S, Roglic G, Green A, et al. Global prevalence of diabetes. Estimates for the year 2000 and projections for 2030 Diabetes Care, May 2004; Vol.27 (5):1047-1053.
6. Fagot-Campagna,Narayan,K.M,Imperatore.G. Type 2 diabetes in children. BMJ.2001; 322(7283): 377-378.
7. Mohan V, Deepa M, Deepa R, Shanthirani CS, Farooq S, Ganesan A, Datta M; Secular trends in the prevalence of diabetes and impaired glucose tolerance in urban South India – The Chennai Urban Rural Epidemiology Study (CURES –17). 2005.
8. Mohan V, Deepa R, Deepa M, Somannavar S, Datta M.A Simplified Indian Diabetes Risk Score for screening for undiagnosed diabetic subjects. J Assoc Physicians India. 2005 Sep;53:75.
9. A.Pranita, J S Kharche , A R Joshi Evaluation of risk for type 2 diabetes mellitus in medical students using Indian Diabetes Risk Score Indian journal of Medical sciences . Jan 2011; Vol.65 (1) : 1-6.
10. Prabha Adhikari, Rahul Pathak, Shashidhar Kotian. Validation of the MDRF - Indian Diabetes Risk Score (IDRS) in another South Indian population through the Boloor Diabetes Study (BDS) . JAPI, July 2010 ; Vol. 58 : 434-436
11. Geer EB, Shen W (2009) Gender differences in insulin resistance, body composition, and energy balance. Gend.Med 6 Suppl 1: 60-75