Risk assessment of Pakistani individual for diabetes in a resource constraint society

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Background

Diabetes and complications associated with it are a huge challenge to the existing health care system of Pakistan. A generalized screening program is necessary for high risk individuals who are suspected to develop diabetes.

Objective

Assessment of Pakistani individuals who are at risk of developing diabetes using a RAPID (risk assessment of Pakistani individuals for diabetes) score.

Methodology

This observational study was a sub-analysis of National Diabetes Survey of Pakistan (NDSP) conducted from August 2016 to August 2017 in all 4 provinces of Pakistan. Ethical approval was obtained from National Bioethics Committee (NBC) Pakistan. Citizens residing in Pakistan with age 20 years or more were included in the study after obtaining informed consent. RAPID score, a validated and published scoring scale to assess risk of Diabetes, originally developed from community based surveys was used. The risk score is assessed by parameters namely; age, waist to hip ratio and positive family history of the disease. Subjects with score greater ≥ 4 is considered at risk of DM. Information regarding social-demography and anthropometric measures, were obtained by a designed questionnaire on one to one interview bases. Blood samples were collected by paramedical staff. Diagnosis of diabetes (DM), impaired glucose tolerance (IGT) and impaired fasting glucose (IFG) was diagnosed according to World Health Organization (WHO) criteria. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 20.

Results

Risk Assessment of Pakistani Individuals or Diabetes Score (RAPID Score)

Age		Waist circumference - Females	
Less than 40 years	0	Less than 80 cm (31.5 inches)	0
Between 40 to 50 years	1	80 cm (31.5 inches) or greater	2
Greater than 50 years	3		
Waist circumference - Males		Family history of diabetes	
Less than 90 cm (35.5 inches)	0	No family history of diabetes	0
90 cm (35.5 inches) or greater	2	Any parent and/or siblings	1

A score of ≥ 4 predicts high risk of developing Type II diabetes

Demographic and biochemical characteristics of study population

Variables	Male	Female	P-value	Total
n	2205	2700		4905
Age (years)	42.96±15.03	40.89±13.4	<0.0001	41.82±14.19
Marital status				
Single	379(17.5%)	384(14.6%)	<0.0001	763(15.9%)
Married	1787(82.5%)	2240(85.4%)		4027(84.1%)
Tobacco addiction				
Yes	606(27.8%)	144(5.5%)	<0.0001	750(15.6%)
No	1572(72.2%)	2486(94.5%)		4058(84.4%)
Family history of diabetes				
Yes	644(29.2%)	735(27.2%)	0.124	1379(28.1%)
No	1561(70.8%)	1965(72.8%)		3526(71.9%)
Weight (kg)	73.64±14.87	65.73±14.7	<0.0001	69.3±15.29
Height (cm)	168.45±9.98	154.9±9.64	<0.0001	160.99±11.89
Body mass index (kg/m2)	26±5.23	27.52±6.2	<0.0001	26.84±5.84
Waist circumference (cm)	92.13±13.69	91.64±14.59	0.228	91.86±14.19
Hip circumference (cm)	101.18±14.75	102.09±17.66	0.106	101.68±16.43
Waist-to-hip ratio	0.94±0.15	0.94±0.23	0.559	0.94±0.2
Systolic blood pressure (mmHg)	125.19±16.87	124.3±19.23	0.093	124.7±18.22
Diastolic blood pressure (mmHg)	83.07±12.04	83.31±13.73	0.535	83.2±13.01
Fasting blood sugar (mg/dl)	93.59±38.84	92.56±36.99	0.345	93.02±37.83
Random blood sugar (mg/dl)	129.7±52.78	130.06±48.18	0.806	129.9±50.29
Cholesterol (mg/dl)	192.43±58.46	191.46±59.57	0.626	191.85±59.12
Triglycerides (mg/dl)	191.9±128.8	169.03±109.68	<0.0001	178.2±118.23
High density lipoprotein (mg/dl)	30.75±11.52	34.17±14.96	<0.0001	32.8±13.78
Low density lipoprotein (mg/dl)	121.76±38.37	121.52±39.26	0.857	121.62±38.9

Sensitivity and specificity analysis of RAPID score

RAPID Score	WHO GTT Classification		
	DM	NGT or PDM	Total
At risk	230	1038	1268
Not at risk	277	3360	3637
Total	507	4398	4905
Sensitivity	45.36%		
Specificity	76.39%		

Here, DM = Diabetes Mellitus
PDM= Pre-Diabetes Mellitus (Includes Impaired & Fasting Glucose Tolerance)
NGT = Normal Glucose Tolerance

Comparison of OGTT with RAPID Score

Conclusion

A simple diabetes risk score, based on a set of variables can be used for the identification of high risk individuals for early intervention to delay or prevent type 2 diabetes. Community based awareness programs are needed to educate people regarding healthy lifestyle in order to reduce the risk of diabetes.

*Riaz M, et al., Risk assessment of Pakistani individuals for diabetes (RAPID). Prim Care Diabetes. 2012, 6: 297-302

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