



RESULTS OF SCREENING FOR PREDIABETES AND TYPE 2 DIABETES MELLITUS IN KHOREZM REGION USING THE FINDRISK SCALE

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Abstract

Purpose of the study- estimator results of screening for prediabetes and type 2 diabetes mellitus in Khorezm region using the FINDRISK scale

Material and research methods. 2,211 participants in the Yangiaryk district of Khorezm region were interviewed by trained specialists regarding socio-demographic characteristics, behavioral risk factors (including smoking and alcohol consumption), history of diabetes and hypertension and their treatment, history of major cardiovascular diseases and other chronic diseases, physical activity (PA), family history of T2DM and cardiovascular disease, meal frequency and other health, lifestyle and social characteristics.

Research results. Arterial hypertension syndrome was detected in 423 (19.1%) patients (282 men and 141 women). Fasting hyperglycemia was detected in 23 patients (1%). Dyslipidemia was found in 296 patients (13.4%).

Conclusions. 1. Of the 2211 individuals examined, 1612 (72.9%) were diagnosed with varying degrees of obesity. At the same time, 872 men and 739 women. It should be noted that out of 1612 individuals, 4 (0.2%) were diagnosed with grade 4 obesity, 62 (3.8%) had grade 3 obesity, 167 (10.3%) had grade 2 obesity, and 1379 (85.5%) had grade 1 obesity. 2. Among men, the best predictors of type 2 diabetes were BMI, fasting hyperglycemia, hypertension, and family history of diabetes. Among women, the best predictors were BMI, fasting hyperglycemia, hypertension, and fasting hyperglycemia.

Keywords: Screening, risk factors, prediabetes





Introduction

Background: In recent decades, the prevalence of diabetes mellitus (DM) among the world population has been steadily increasing, making DM a medical and social problem worldwide [1]. According to the International Diabetes Federation's 2019 forecast, the number of people with diabetes is expected to reach 578 million by 2030, and 700 million by 2045 [2].

It is known that T2DM is a multifactorial disease, and environmental factors are important in the pathogenesis of T2DM. Risk factors for T2DM are well known and include abdominal obesity (waist circumference (WC) ≥ 94 cm in men and ≥ 80 cm in women), family history of diabetes, age >45 years, hypertension and major cardiovascular disease (CVD), gestational diabetes, use of drugs that promote hyperglycemia, and weight gain. Early identification of T2DM risk factors and their clusters for modification may help prevent T2DM [6,7]. Currently, preventive strategies are based on identifying risk factors and their combinations and subsequent lifestyle interventions. Appropriate lifestyle changes, including normalizing diet, increasing physical activity, and losing weight, can reduce the risk of T2DM by as much as 56% [8].

One of the first tools to identify individuals at high risk of developing T2DM is the Finnish Diabetes Risk Score (FINDRISC) [9,10]. This tool has subsequently been successfully tested in other countries, including Germany, Holland, Denmark, Sweden, England and Australia [10,eleven]. The results show good sensitivity (Se) and specificity (Sp) in Germany, USA, Switzerland and Canada [12,13,14,15], although he did not perform well among Omani Arabs [16].

To prevent further increases in the prevalence of diabetes, identifying individuals at high risk of hyperglycemia using inexpensive and accessible methods is critical. The use of risk scale prediction methods makes it possible to establish the level of overall risk, identify patients at high risk and prescribe the necessary preventive measures.

The above was the basis for this study.

The purpose of the study is to evaluate results of screening for prediabetes and type 2 diabetes mellitus in Khorezm region using the FINDRISK scale

Material and research methods. 2,211 participants in the Yangiaryk district of Khorezm region were interviewed by trained specialists regarding socio-demographic characteristics, behavioral risk factors (including smoking and alcohol consumption), history of diabetes and hypertension and their treatment, history of major cardiovascular diseases and other chronic diseases, physical activity (PA), family history of T2DM and cardiovascular disease, meal frequency and other health, lifestyle and social characteristics.



Objective measurements included anthropometry (body weight, height, WC and hip circumference) and blood pressure (BP). Body weight was measured on a scale while the participant was wearing one layer of clothing (accuracy to the nearest 0.1 kg). Height was measured using a vertical stadiometer (accuracy 0.1 cm). WC and hip circumference were measured using a tape with an accuracy of 0.1 cm.

Blood pressure was measured after a 5-minute rest on the right arm in a sitting position.

Selected variables included age, BMI, abdominal obesity, hypertension, dyslipidemia (high TG and low HDL-C), history of cardiovascular disease, smoking status, alcohol consumption, education level, marital status, physical activity, fruit and vegetable intake and family history of diabetes.

HRs with 95% confidence intervals (CI) were calculated for the above factors selected as independent variables. In men, the multivariate model included age, BMI ≥ 25 kg/m², hypertension, high TG, LDL, family history of diabetes, and history of CVD. For women, the model included age, BMI ≥ 25 kg/m², hypertension, high TG, LDL, education level, marital status, family history of diabetes and history of CVD.

Baseline characteristics of study participants are presented as mean values (SD) and compared using the χ^2 test, unpaired Student's t test, or Mann–Whitney test, depending on the type of variable distribution.\

Research Results

Table 1 gives the characteristics of the studied sample of the population, namely in the Yangiaryk region of the Khorezm region.

Men with newly diagnosed T2DM had higher total cholesterol levels, were less likely to be current smokers, and were more likely to be former smokers than their peers without T2DM. Women with newly diagnosed T2DM had a more frequent history of cardiovascular disease, less physical activity, and more often had a high school education level than their peers without T2DM.

Table 1 Characteristics of the study population sample (age 45–69 years at the time of study, n = 2211).

Indicators	Men and women	Men	Women	R
Inspected	2211	1094	1117	
Age (years)	58.7 \pm 5.6	55.8 \pm 6.4	57.6 \pm 7.3	0.211
height (cm)	164.6 \pm 9.8	170.6 \pm 9.6	157.4 \pm 6.6	<0.001
Weight, kg)	75.8 \pm 12.8	78.6 \pm 12.6	75.6 \pm 7.8	<0.001
BMI (kg/m ²)	28.7 \pm 6.5	26.3 \pm 4.7	26.7 \pm 8.5	<0.001
Waist circumference (cm)	91.7 \pm 11.4	93.0 \pm 11.2	90.7 \pm 12.9	<0.001



Indicators	Men and women	Men	Women	R
Abdominal obesity, n (%)	1612± 64.8	872 ± 22.3	739± 19.1	<0.001
SBP (mmHg)	142.8±24.5	142.4 ±22.6	143.1 ±25.8	0.202
DBP (mmHg)	92.0 ± 10.8	93.0 ±13.7	89.7±13.5	0.899
FPG (mmol/l)	5.61±0.9	5.73± 1.5	5.62± 1.6	0.003
TG (mmol/l)	1.4 ± 0.8	1.6 ±0.5	1.8 ± 1.9	<0.001
HDL cholesterol (mmol/l)	1.8±0.4	1.9±0.7	1.4±0.8	<0.001
Hypertension * n (%)	423 ± 63.5	282 ± 61.7	141± 64.8	0.005
Low HDL-C ■, n (%)	18±0.6	9.8±0.8	17.2 ± 0.6	0.028
High TG ♦, n (%)	296 ± 13.8	125 ± 16.7	171 ± 13.9	0.609
Fasting hyperglycemia ●, n (%)	23 ± 5.2	18 ± 2.2	10± 1.4	0.045
BMI ≥ 25 kg/m ² , n (%)	2001 ± 71.3	993±23.6	1008± 34.6	<0.001
Current smoker	127 ± 23.6	127±23.6	0	
Family history of T2DM (%)	863 ± 11.2	300±9.0	563± 12,	<0.001
History of CVD, n (%)	832± 10.8	475± 14.1	357± 8.2	<0.001
Consumption of fruits and vegetables less frequently than every day [^] , n (%)	833 ± 10.5	361± 10.7	472± 10.8	0.856
Free time in the previous week #, min	65± 80.9	10±2.8	55 ± 7.2	<0.001

Abdominal obesity: waist circumference (WC) ≥ 94 cm in men and ≥ 80 cm in women.

*Hypertension is determined by

As can be seen from Table 1, of the 2211 individuals examined, 1612 (72.9%) were diagnosed with varying degrees of obesity. At the same time, 872 men and 739 women. It should be noted that out of 1612 individuals, 4 (0.2%) were diagnosed with grade 4 obesity, 62 (3.8%) had grade 3 obesity, 167 (10.3%) had grade 2 obesity, and 1379 (85.5%) had grade 1 obesity.

Arterial hypertension syndrome was detected in 423 (19.1%) patients (282 men and 141 women). Fasting hyperglycemia and IGT were detected in 23 patients (1%). Dyslipidemia was found in 296 patients (13.4%).

Individuals of both sexes who were diagnosed with T2DM were younger, had a higher BMI, a greater CV, more frequent abdominal obesity, higher SBP and DBP, more frequent hypertension, a more frequent family history of DM, and higher levels of GNT, TG, and cholesterol -HDL compared to individuals without T2DM.



Men with T2DM had higher TG levels, were current smokers, and were more likely to be former smokers than their counterparts without T2DM. Women with T2DM were more likely to have a history of CVD, were less likely to engage in physical activity, and were more likely to have completed secondary education than their peers without T2DM.

Further in Table 2 we calculated using multivariate adjusted Cox regression analysis.10-year risk score for T2DM.

Table 2 10-year risk score for T2DM.

T2DM predictor		Interval scale (category)	Points
Men			
1	Fasting plasma glucose >6.0 mmol/L	No	0
		Yes	4
2	BMI \geq 27 kg/m ²	No	0
		Yes	3
3	HDL-C level \leq 0.9 mmol/l	No	0
		Yes	2
4	TG level \geq 1.4 mmol/l	No	0
		Yes	2
5	Blood pressure level \geq 150/90 mm Hg.	No	0
		Yes	2
Women			
1	FROM \geq 95 cm	No	0
		Yes	2
2	Fasting plasma glucose \geq 5.7 mmol/L	No	0
		Yes	3
3	TG level \geq 1.5 mmol/l	No	0
		Yes	2
4	Blood pressure level \geq 135/90 mm Hg.	No	0
		Yes	2
5	family history of T2DM	No	0
		Yes	2
6	BMI \geq 32 kg/m ²	No	0
		Yes	1

In multivariate regression analysis, we identified gender differences in risk factors for developing T2DM. Among men, the best predictors of type 2 diabetes were BMI, fasting hyperglycemia, hypertension, and family history of diabetes. Among women, the best predictors were BMI, fasting hyperglycemia, hypertension, and fasting hyperglycemia.



Conclusions

1. Of the 2211 individuals examined, 1612 (72.9%) were diagnosed with varying degrees of obesity. At the same time, 872 men and 739 women. It should be noted that out of 1612 individuals, 4 (0.2%) had grade 4 obesity, 62 (3.8%) had grade 3 obesity, 167 (10.3%) had grade 2 obesity, and 1379 (85.5%) had grade 1 obesity. 2. Among men, the best predictors of type 2 diabetes were BMI, fasting hyperglycemia, hypertension, and family history of diabetes. Among women, the best predictors were BMI, fasting hyperglycemia, hypertension, and fasting hyperglycemia.

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