Spectrum Journal of Innovation, Reforms and Development
Volume 26, April - 2024 | ISSN (E): 2751-1731
Website: www.sjird.journalspark.org

ASSESSMENT OF THE RISK OF DEVELOPING DIABETES MELLITUS FOR MEN

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Abstract

Goal

To assess the risk of developing type 2 diabetes mellitus (DM2) in patients with different risks of cardiovascular (CC) complications, as well as to identify the relationship between a high risk of DM2 and the main risk factors of CC.

Material and methods

126 men with one or more CC risk factors (arterial hypertension 1-3 art., smoking, hypercholesterolemia) and different CC risk levels on the SCORE scale were included in a single-stage clinical study. All patients were interviewed using a standard questionnaire and the FINDRISCAN questionnaire, and a glucose tolerance test was performed.

Results

Patients were divided into three groups according to the level of total CC risk according to SCORE: 33.6% had low/moderate CC risk, 38.9% had high and 27.5% had very high CC risk. Most of the men were in the age groups of 50-59 and 60-69 years. In the 40-49 age group, most patients had a high CC risk, whereas 59% of men aged 50-59 years had a moderate CC risk. Every second older man has a very high CC risk. According to the results of the FINDRISCAN survey, 40.2% had a low risk of developing DM2 in the next 10 years, 35.2% had an intermediate risk, 10.3% had a moderate risk, 11.1% of patients had a high risk, and 3.2% of patients had a very high risk.

Conclusion

Individuals with a very high CC risk on the SCORE scale also have a high and very high risk of developing DM2 according to the FINDRISCAN questionnaire. Among patients with one or more of the above CC risk factors, it is necessary to identify early markers of carbohydrate metabolism disorders and assess the risk of developing DM2. Such tactics contribute to an adequate assessment of the risk of DM2 and the development of methods for its prevention.

Keywords: early disorders of carbohydrate metabolism, cardiovascular diseases, type 2 diabetes mellitus.

Introduction

Cardiovascular diseases (CVD) hold the primacy among socially significant diseases in the 21st century. To date, the share of mortality from CVD in the structure of adult mortality is 40-60%. Coronary heart disease (CHD) and cerebral stroke occupy the leading positions among CVD. In recent years, there has been a tendency to "rejuvenate" these diseases. On the other hand, among patients with CVD, the frequency of carbohydrate metabolism disorders, in particular In particular, type 2 diabetes is steadily growing. According to the data of large clinical studies, there is an inextricable link between diabetes and cardiovascular pathology, which makes it possible to consider diabetes as the endocrinological equivalent of coronary heart disease. If we take into account that a significant part of patients with type 2 diabetes have a disease duration of about 10 years at the time of diagnosis, it becomes clear why a fairly high percentage of macrovascular complications is detected. According to WHO experts, every 10–the number of DM patients has been doubling for 15 years. It happens mainly due to the increase in the number of patients suffering from type 2 diabetes, which, according to S.R. Kahn, accounts for about 6-7% of the total population. Thus, primary prevention of diabetes is one of the priority areas for reducing the risk of developing cardiovascular complications. The main strategy for the primary prevention of type 2 diabetes is to identify early markers of carbohydrate metabolism disorders in patients with the presence of factors risk of CVD. Traditionally, a glucose tolerance test is performed to detect early disorders of carbohydrate metabolism. However, in recent years, screening experts have also suggested the use of questionnaires. Thus, the combined recommendations of the European Society of Cardiology and the Society for the Study of Diabetes suggest the use of a questionnaire to assess the risk of developing type 2 diabetes Finnish Diabetes Risk Score, prepared on the basis of a prospective study assessing the risk of developing type 2 diabetes in the Finnish population. This questionnaire allows you to predict the risk of developing diabetes in the next 10 years. The purpose of this study is to assess the risk of developing type 2 diabetes in patients with different risks of cardiovascular complications, as well as to identify the relationship between the high risk of developing type 2 diabetes and the main cardiovascular risk factors in cardiological practice.

MATERIALS AND METHODS OF RESEARCH

The study consistently included 126 men aged 40-69 years with low-moderate (<5% on the SCORE scale), high (5-10% on the scale SCORE) and a very high (>10% on the SCORE scale) cardiovascular risk without clinical manifestations of CVD, who went to the polyclinic to see a doctor for any reason.

The criteria for inclusion in the study were the presence of one or more of the following risk factors: arterial hypertension (AH) 1-3 degrees, smoking, hypercholesterolemia [total cholesterol (HC) >5 mmol/l].

Exclusion criteria:

1. Type 1 and type 2 diabetes mellitus
2. Angina pectoris of tension and rest
3. A history of myocardial infarction
4. Heart and vascular defects
5. Myocarditis, myocardiodystrophy
6. Heart failure
7. History of strokes of any origin

8. Peripheral atherosclerosis
9. Kidney and liver failure
10. Blood diseases
11. Pulmonary insufficiency
12. Oncological diseases
13. Collagenoses
14. Endogenous mental illnesses

The survey of patients included in the study was conducted using a Russified version of the standard ARIC questionnaire (Atherosclerosis Risk in Communities) on the following issues: passport data, social status, family history, smoking status, alcohol consumption, nutrition assessment, concomitant diseases, medications taken.

A survey was also conducted among all participants using the FINDRISCUS questionnaire. To determine the risk of developing type 2 diabetes, the following

parameters are taken into account: age, body mass index (BMI), waist circumference (OT), fruit and vegetable intake, physical activity, presence of hypertension, glycemic status, presence of diabetes in relatives. Several possible answers are proposed and the total score is calculated, which determines the risk of developing type 2 diabetes. In our country, this affordable method of predicting the risk of developing type 2 diabetes is not used. Obviously, this is due to the lack of clinical data on the expediency of using the questionnaire in practical medicine, in particular, among people with risk factors for development CVD and SD.

To increase the volume of groups and analyze the total scores obtained on the SCORE scale and the questionnaire FINDRISCUS, the patients were divided into groups according to to the FINDRISCUS questionnaire: low risk of developing type 2 diabetes (total points <7), intermediate/moderate risk (total score 7-14), high/very high risk (total score >14); on the SCORE scale: low/moderate risk (0-4%), high (5-9%), very high (>10%).

Anthropometric parameters

All patients were evaluated:

• height with an accuracy of 0.5 cm; body weight with an accuracy of 0.1 kg; Quetelet index (as the ratio of body weight in kilograms to the square of height in meters); waist circumference with an accuracy of 0.5 cm.

• Blood pressure with a mechanical tonometer on the right hand with an accuracy of 2 mmHg, twice with a 5-minute at intervals, in a sitting position at rest. Systolic blood pressure (SAD) was recorded at the appearance of the I tone Korotkov (phase I), diastolic blood pressure (DBP) — with the disappearance of Korotkov tones (phase V). The average value of two measurements was used for the analysis.

• Electrocardiogram (ECG) in 12 standard leads, lying down, on the SCHILLER

CARDIOVIT AT-1 device (Switzerland). To diagnose left ventricular hypertrophy (LVH), it was used The Sokolov-Lyon ECG test. LVH according to this criterion is determined if SV1+RV5(V6) >3.5 mV, and/or RaVL >1.1 mV, and/or RI >1.5 mV, and/or RII >2.0 mV, and/or RIII >2.0 mV.

Laboratory tests

Blood was taken from the ulnar vein in the morning on an empty stomach after 12 hours of fasting. The levels of total cholesterol, triglycerides (TG), high-density lipoprotein cholesterol (HDL) and low-density lipoprotein cholesterol (LDL), as well as glucose in venous blood plasma on an empty stomach and 2 hours after ingestion were determined 75 g of glucose.

Statistical analysis

The data obtained were processed using the statistical package SPSS 17.0. Within the framework of this study, the following were used: -2, Student's t-test and Fisher's criterion (F-test), Dunnett's t-criteria. By The construction of the logistic regression took into account the unmodified risk factors of the SCORE scale and the FINDRISCUS questionnaire.

THE RESULTS AND THEIR DISCUSSION

According to the study protocol, patients were divided into three groups according to the level of total cardiovascular risk according to SCORE: 33.6% of them had a low/moderate risk, 38.9% had a high risk and 27.5% had a very high risk. Along with this, the patients were divided into three age groups: the first group was 40-49 years old, the second group was 50-59 years old, and the third group was 60-69 years old. As expected, among the ones we studied men aged 60-69 years (48.6%) prevailed among those with a very high cardiovascular risk, men aged 50-59 years turned out to be 9.6%, and people younger than 50 years were not in this risk category. In the high cardiovascular risk group, approximately equal proportions were men aged 50-59 (33.5%) and 60-69 (36.8%) years. We conducted an analysis of the likelihood of developing type 2 diabetes in different age groups among people with different CVD risks. In general, positive associations of the risk of developing type 2 diabetes with age were revealed (r=0.369; p=0.001). So, in the age group 40– At the age of 49, a very high risk of developing type 2 diabetes was observed in 9.3% of patients, at the age of 50-59 years–in 40.7%, whereas in the age group of 60-69 years, a very high risk of developing type 2 diabetes was detected in every second patient. In the older age group, the number of patients with low and moderately increased risk of developing diabetes Type 2 is statistically significantly less compared to younger patients (p=0.001). The analysis of the results shows that among the surveyed men with different levels of cardiovascular risk on the SCORE scale as a whole 14.3% of patients had a high and very high risk of developing type 2 diabetes in the next 10 years according to the FINDRISK questionnaire. The largest number of patients with low risk of type 2 diabetes occurs among people with low/moderate cardiovascular risk (62.2%), whereas in groups with high and With a very high cardiovascular risk, the probability of developing type 2 diabetes in the next 10 years is determined in 36.1% and 19.2%, respectively. Every second patient with high and very high cardiovascular risk has a moderate risk of developing type 2 diabetes. A similar indicator among people with low-moderate cardiovascular risk is detected in every third patient. A greater number of patients with high and very high risk of developing type 2 diabetes were found among men with very high cardiovascular risk (26.9%), which is 2-3 times more than in the groups of patients with high and low/moderate cardiovascular risk: 13.6% and 4.7%, respectively.

We also determined the relationship of individual cardiovascular risk factors with a high and very high risk of developing type 2 diabetes. The high frequency of smokers was found in the group of men with very high cardiovascular risk with a high risk of developing diabetes (22.2% vs. 1.6% and 9.8% in the first and second groups, respectively). In all three groups, among people at high risk of developing type 2 diabetes, hypertension occurs with the same frequency: 83.3%, 95% and 85.7%, respectively. As expected, high levels of total cholesterol and LDL cholesterol were found in 2-3 twice as often among people at high risk of developing type 2 diabetes in the group of very high cardiovascular risk.

A similar trend is observed in the frequency of low HDL cholesterol levels. In all three groups, there is a close relationship between impaired glucose tolerance (HTG) and a very high risk of developing type 2 diabetes, whereas high fasting glycemia (HCG) is 2-3 times more common among people with a very high risk of cardiovascular complications compared with the first two groups.

In the low/moderate and high cardiovascular risk groups among people with a very high risk of developing type 2 diabetes, the incidence of obesity, including abdominal obesity, is 1.5-2 times lower than in patients with very high risks of cardiovascular complications and the development of type 2 diabetes. The frequency of sedentary lifestyle has a similar tendency.

One of the objectives of the study is to identify early disorders of carbohydrate metabolism using a glucose tolerance test among people with different levels of cardiovascular risk on the SCORE scale.

Early disorders of carbohydrate metabolism (prediabetes) They were detected in 20 (20.5%) patients with low/moderate cardiovascular risk, and in the high and very high cardiovascular risk groups - in 67 (45.6%) and 44 (42.3%) patients, respectively. According to the results of the test, HTG was detected to a greater extent in people with high cardiovascular risk (68.8%), in contrast to men with low/moderate cardiovascular risk (31.3%). A more detailed analysis showed that in the low/moderate cardiovascular risk group, HCV is detected in 24.7%, and a combination of HCV+HTG is detected in 9.6%. In the group of high cardiovascular risk, in 42.5%, HCV is detected, and in 68.8% - HTG, and a combined violation of carbohydrate metabolism was detected in 10.3% of men. In individuals with a very high cardiovascular risk, a combined violation of carbohydrate metabolism was found in 19.2%, and IOP in 32.9%.

The main objective of this study is to identify a high risk of developing type 2 diabetes among people with different levels of cardiovascular risk. This approach is based on several arguments. A number of epidemiological studies have shown that the risk of death from CVD is 2-3 times higher in people with diabetes than without it. So, in the EURODIAB study IDDM Complication Study among 3,250 DM patients from 16 European countries, the incidence of CVD increased from 6% in the 15-29 age group to 25% in the 45-59 age group, while it depended on the duration SD. 20 years after the onset of DM, CVD was detected in 29% of patients. On the other hand, the frequency of diabetes and early disorders of carbohydrate metabolism increases among people with coronary heart disease. According to the Euro study Heart Survey, among people with acute coronary syndrome, diabetes mellitus and prediabetes are detected in 65% of cases. Therefore, the identification of a high risk of SDS in individuals with different levels of cardiovascular risk is of great importance in the primary prevention of CVD. We used the FINDRISC questionnaire to predict type 2 diabetes. It is known that this method applies to It belongs to the category of a routine screening method for assessing the risk of developing type 2 diabetes in the next 10 years. The questionnaire was compiled on the basis of a prospective study with solid endpoints. Of course, it is of practical importance primarily in cardiological practice, since patients with early markers of carbohydrate metabolism disorders are found mainly among patients with risk factors for cardiovascular complications.

This group primarily includes people with hypertension, overweight and obesity, dyslipidemia and metabolic syndrome. Thus, we have studied the possibility of using the FINDRISCUS questionnaire in cardiology practice. On the other hand, we conducted an analysis on the combination of cardiovascular risk with the risk of developing type 2 diabetes. The identification

of patterns makes it possible to determine the tactics of primary prevention of both type 2 diabetes and CVD.

In this study, among men with different levels of cardiovascular risk, in 15% of cases, a high and very high risk of developing Type 2 diabetes, whereas in most patients it is detected low and intermediate risk. The majority of patients with a very high risk of developing type 2 diabetes simultaneously have a very high cardiovascular risk. It would be more logical to argue that patients with very high cardiovascular risk should also undergo primary prevention of diabetes, since the conversion of early carbohydrate metabolism disorders into type 2 diabetes increases the cardiovascular risk with a fatal outcome by 2-3 times. It is also necessary to carry out primary prevention of diabetes among people with high cardiovascular risk, since, according to our data, one in six patients has high risk of developing diabetes. To study the relationship between the high risk of type 2 diabetes according to the FINDRISCAN questionnaire and individual risk factors, we analyzed the frequency of high and very high risk of type 2 diabetes among people with risk factors. It turned out that smoking, hypercholesterolemia and low HDL cholesterol are associated with a very high risk of developing type 2 diabetes, whereas Hypertension is associated with both a very high and high risk of developing type 2 diabetes. It should be emphasized that in this study, regardless of the level of cardiovascular risk, the majority of patients with a very high risk of developing type 2 diabetes have a high frequency of HYPERTENSION. In general, HTG is considered as one of the risk factors for CVD. According to the results of the study DECODE (involving more than 22,000 patients from 10 European countries), in patients with diabetes diagnosed on the basis of a glucose tolerance test, mortality from all causes, including CVD, was higher than in people without postprandial hyperglycemia. A significant increase in mortality was also observed in patients with HTH, while in patients with impaired and normal fasting glycemia, mortality did not differ. Multivariate analysis showed that high glycemia 2 hours after glucose loading makes it possible to predict mortality from all causes, CVD (adjusted for other major cardiovascular risk factors), whereas fasting hyperglycemia By itself, it had no predictive value. High postprandial glycemia was a factor the risk of death regardless of fasting glycemia, while increased mortality in patients with fasting hyperglycemia was largely associated with a simultaneous increase in glycemia through 2 hours after the glucose load. In our study, HCV is 2-3 times more common among people with a very high risk of cardiovascular complications and the risk of developing type 2 diabetes than in patients with low/moderate and high cardiovascular risk.

CONCLUSIONS

The assessment of the risk of developing diabetes and the identification of a high-risk group is an important stage of primary prevention. According to the data of this study, individuals with a very high risk on the SCORE scale also have a high and very high risk of developing Type 2 SD according to the FINDRISCUS questionnaire. Risk factors such as smoking, hypertension, dyslipidemia and obesity are closely associated with a high and very high risk of developing type 2 diabetes. Therefore, in patients with one or more of the above risk factors , it is necessary to identify early markers of carbohydrate metabolism disorders and assess the risk of developing DM2 like. Such tactics contribute to an adequate assessment of the risk of developing type 2 diabetes and the development of methods for its prevention.

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