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Assessment of the Risk of Development of Diabetes Mellitus in Men with Risk Factors of Cardiovascular Diseases

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RESUME. This paper explores potential ways in which the dynamics of cardiovascular risk factors over time could mediate the effect of glycosylated hemoglobin on the risk of cardiovascular disease over a 28-year follow-up in the Diabetes and Complications Control Study Epidemiology of Interventions and complications in diabetes mellitus.

KEYWORDS: diabetes mellitus, risk factors, cardiovascular disease, man, assessment, development risk.

I. RELEVANCE

Diabetes mellitus is one of the most powerful risk factors for the development of cardiovascular disease. In 50% of patients with type 1 diabetes and 80% of people with type 2 diabetes, early disability and premature death are recorded due to cardiovascular complications [3].

People with diabetes are often at risk of strokes, heart attacks, and high blood pressure. Vascular problems in the extremities are also a common complication in diabetes mellitus. In this case, the development of complications can be asymptomatic for several years.

It is a misconception that heart disease develops in adulthood and old age. In diabetes mellitus, cardiovascular diseases can occur up to 30 years of age [7].

Diabetes mellitus (DM) is a severe endocrine disorder in which blood sugar levels rise (hyperglycemia) as a result of impaired production of the hormone insulin by the pancreas or a decrease in the sensitivity of body tissues to it.

Today, there are more than 40 r, various factors that, under appropriate conditions, can lead to diabetes mellitus.

Inheritance is typical for both types of diabetes, but it is more common in type 2 diabetes, it is inherited in 80% of cases through the mother and father. Type 1 diabetes is inherited maternally in 3-7% of cases, paternal - in 10% of cases. The development of diabetes is due to certain defects in genes responsible for the full synthesis of insulin. It can be passed on not only to children! but also after a generation, increasing the risk of developing diabetes by 2-6 times. Twins are very likely to get sick [4].

The main provoking factor of type 1 diabetes is considered to be viral infections: rubella, chickenpox, mumps, viral hepatitis. The viruses of these diseases selectively infect insulin cells, which lose their ability to synthesize high-grade insulin. This leads to the appearance of severe symptoms of diabetes: thirst, increased urination, increasing weight loss, and in the absence of timely medical care, the development of a diabetic coma with loss of consciousness.

Despite the progress made in recent years in treatment methods, the risk of developing cardiovascular disease in type 1 diabetes remains higher than in a comparable age population without diabetes mellitus. Over the average follow-up period (up to 17 years) during the Diabetes Control and Complication Trial and monitoring its spread in the Epidemiology of Diabetes Interventions and Complications study, it was found that on average 6, 5 years of intensive antidiabetic therapy leads to a decrease in the average level of glycosylated hemoglobin to $\approx 7\%$ (53 mmol / mol); to reduce the risk of developing cardiovascular diseases by 42%; and reducing the risk of non-fatal myocardial infarction, stroke or death from cardiovascular diseases (major atherosclerotic cardiovascular events) by 57% compared to conventional therapy, in which the average glycosylated hemoglobin value is $\approx 9\%$ (75 mmol / mol).

The reliability of the protective effect of the 6.5-year intensive therapy course was confirmed by at least another 10-year observation period. Over the entire period of both studies (28 years), intensive therapy reduced the incidence of cardiovascular disease by 30% compared to conventional therapy, despite similar glycemic levels during most of the observation period of the epidemiology of interventions and complications in diabetes.

The high incidence of cardiovascular complications in patients with diabetes mellitus (DM) is one of the most important problems of not only domestic, but also world health. The cost of treating diabetes and its complications in



the United States in 2017 amounted to \$ 327 billion, of which 71% are accounted for by complications associated with atherosclerosis [3]. According to the FORESIGHT-T2DM study, in the Russian Federation, the cost of treating T2DM is more than \$ 7,000 per patient per year, and 53.5% of this amount is GDP losses due to patients' disability, 37.7% are direct medical costs, from of which 57% falls on the treatment of complications of diabetes and concomitant diseases, while antihyperglycemic therapy accounts for only 10% [2]. Unfortunately, no country in the world has yet succeeded in significantly reducing the mortality rate from ischemic heart disease in patients with diabetes. Sudden death with diabetes in men develops by 50%, and in women by 300% more often than in persons of the corresponding sex and age without diabetes [6].

The prevalence of ischemic heart disease among patients with type 2 diabetes is 2–4 times higher than the average in the population and is about 70–80%. According to the large INTERHEART study, diabetes mellitus is one of the three most important RFs for the onset of AMI in middle-aged men (after lipid metabolism and smoking disorders), more significant than arterial hypertension (AH) [8]. By the age of 50, almost half of diabetic patients develop at least one of the complications of coronary artery disease: unstable angina pectoris, MI, life-threatening cardiac arrhythmias; rapid development of chronic heart failure (CHF) [4]. According to the PROGNOZ-CHD register, over 7.3 years of observation of 504 patients with a confirmed diagnosis of CHD, the relative risk of developing the primary endpoint (deaths from all causes, fatal and non-fatal cardiovascular events) in the presence of diabetes increased by 1.7, in the presence of a combination of diabetes mellitus with arterial hypertension - 2.4 times [7].

The main risk factor for the development of cardiovascular complications in patients with type 2 diabetes is hyperglycemia. The results of numerous studies have demonstrated that a decrease in the level of glycated hemoglobin (HbA1c) is accompanied by a decrease in the risk of specific vascular complications of diabetes. The most significant is the DCCT (Diabetes Control and Complications Trial) study conducted in 1982-1989. involving a large group of patients with type 1 diabetes mellitus (DM 1), including adolescents. An improvement in glycemic control was shown when switching from a traditional to an intensive scheme of insulin therapy, which was accompanied by a decrease in the risk of development and progression of vascular complications [2]. The EDIC (The Epidemiology of Diabetes Interventions and Complications Research Study) study, which was a continuation of the DCCT study, showed that 4 years after transferring all patients to an intensified insulin therapy regimen against the background of achieving the same glycemic control in both groups of adolescents, the risk of retinopathy progression remained lower in the group. which initially received intensive treatment [1]. This phenomenon is called "positive metabolic memory." The results of this study showed that it is important not only to ensure a decrease in glucose levels to target levels, but also to prevent hypoglycemia, as well as significant fluctuations in blood glucose levels, since all these conditions initiate oxidative stress in the vessels, chronic inflammation, endothelial dysfunction and play an important role. in the development of diabetic complications [6].

The problem of high cardiovascular risk in patients with type 2 diabetes is fully reflected in the current Russian clinical guidelines for the diagnosis and treatment of diabetes mellitus [6].

Assessment of risk factors affecting the development of ischemic heart disease in diabetes includes the following points:

- family history: the presence of coronary artery disease in a female relative of the 1st line under 65 years of age or a male under 55 years of age;
- weight and fat distribution (BMI ≥ 30 kg / m²), abdominal obesity (waist circumference ≥ 94 cm in men and ≥ 80 cm in women);
- the level of physical activity is assessed now and in the past;
- dyslipidemia, including a decrease in HDL cholesterol (2.3 mmol / l);
- arterial hypertension ($\geq 140/85$ mm Hg);
- current and past tobacco smoking and its intensity;
- albuminuria, plasma creatinine level, GFR, urinalysis for albu- 9 Cardiovascular risk factors in patients with diabetes 2 min;
- the patient's age at the time of the onset of hyperglycemia, heredity for diabetes mellitus, vascular complications, fasting plasma glucose, HbA1c level [3].

Establishing a significant role for the cardiologist in the management of a patient with diabetes mellitus 2 is a matter of clinical necessity. The WHO global report on diabetes mellitus (2016) states that for better results, capacity-building efforts in the diagnosis and treatment of diabetes must be undertaken in the context of the integrated management of noncommunicable diseases, in particular when the treatment of diabetes and cardiovascular diseases are combined.



In this regard, the cardiologist should have sufficient knowledge in the field of prevention, diagnosis, treatment of diabetes and its complications, including knowing not only the known effects of the main classes of antidiabetic drugs, but also their pleiotropic cardiovascular effects, as well as the possibility of using lipid-lowering and antihypertensive therapy in relation to patients with diabetes 2.

The most important condition for modern treatment of diabetes mellitus 2 is early diagnosis of this disease, since an increase in the duration of "untreated" diabetes significantly worsens the patient's prognosis. The cardiologist and therapist are often first-line physicians who identify abnormal glucose metabolism in individuals with cardiovascular disease.

It is known that about 30% of patients admitted to specialized clinics with a diagnosis of ACS have a history of impaired glucose tolerance or recently diagnosed diabetes mellitus.

The cardiologist should have in-depth knowledge and skills on nutrition, adequate physical activity, correction of CVD risk factors such as smoking, hypertension and dyslipidemia. In this regard, the treatment of a patient with type 2 diabetes, along with long-term maintenance of target glycemic parameters, should be aimed at managing the prognosis of patients in terms of the risk of developing cardiovascular complications.

Purpose of the study. The study of the risk assessment of diabetes in men with a risk factor for cardiovascular diseases and its implementation in practice.

III. MATERIALS AND RESEARCH METHODS

For the choice of the problem, we selected 65 men with a risk factor for cardiovascular diseases and assessed the risk factor for diabetes using modern methods.

IV. RESEARCH RESULTS

Studies to control diabetes and its complications have not survived any cardiovascular event. This milestone was reached in 2021, after which a formal analysis of risk factors was carried out. Cox's multivariable model, which was also corrected for age, duration of diabetes mellitus, use of angiotensin-converting enzyme inhibitors, and family history of myocardial infarction, found that mean glycosylated hemoglobin was a stronger predictor of future cardiovascular events than mean systolic blood pressure, low density lipoprotein cholesterol, circulating triglycerides and pulse rate.

However, this analysis did not allow modulation of covariance effects over time and did not take into account the possibility of the influence of glycosylated hemoglobin on other risk factors for the development of cardiovascular diseases.

The study used data from 65 participants with one or more cardiovascular disease and complications from diabetes over a 27-year follow-up. Analysis of the data showed that the effect of the average glycosylated hemoglobin value on the risk of developing cardiovascular diseases was constant, regardless of the passage of time.

With increased values of glycosylated hemoglobin, the increase in the incidence of cardiovascular etiology was approximately 3.3 cases per 1000 patients per year. The predicted value (area under the curve) of glycosylated hemoglobin over a 10-year period decreased from about 0.72 over a 10–20-year interval to 0.69 over a 20–30-year interval, while the same value for traditional risk factors for development cardiovascular disease (systolic blood pressure, heart rate, triglycerides and low-density lipoprotein cholesterol) increased slightly.

The level of risk associated with each of the covariates remained unchanged over time. However, an indirect effect of the level of glycosylated hemoglobin in the blood serum on the development of risk factors for cardiovascular diseases was noted. In fact, the effect of glycosylated hemoglobin on the risk of cardiovascular disease is due to its indirect effect on systolic blood pressure, pulse rate, triglyceride or low-density lipoprotein cholesterol levels. At the baseline of the Study on the Control of Diabetes and Its Complications, individuals with high blood pressure and hypercholesterolemia were excluded. Thus, the only major risk factor associated with the operant was hyperglycemia, which naturally predominated. It is possible that hyperglycemia has a significant effect in the early stages of the progression of cardiovascular diseases, for example, atherosclerotic process.

These results are of clinical importance for further understanding of the possible mechanisms of development of cardiovascular diseases in type 1 diabetes mellitus. Over 20-30 years of observation (27-37 years of the course of the disease), the level of low-density lipoprotein cholesterol mediated 31% of the effect of glycosylated hemoglobin. In this case, therapy should be aimed at lowering the level of low-density lipoprotein cholesterol in serum. The results obtained by the authors further enhance the value of intensive glycemic control in the early stages of diabetes mellitus, and then the management of other risk factors for the development of cardiovascular diseases, since their activity increases over time.



Men of working age in 40% of cases at the time of examination have a very high risk of developing diabetes. Moreover, in most cases, a high risk of developing diabetes is combined with the presence of risk factors such as hypertension, dyslipidemia, hyperuricemia, and LVH. The use of the FINDRISK scale significantly expands the ability of primary care physicians to identify the risk group for developing diabetes.

In the future, conducting extended diagnostics in the form of a glucose tolerance test will determine the tactics of prevention and drug correction to slow and prevent diabetes among people with high and very high cardiovascular risk.

Output. With diabetes mellitus, in order to prevent cardiovascular diseases, careful control of body weight, daily exercise, quitting smoking and alcohol is required. It is necessary to maintain normal three main indicators:

- the level of glycated hemoglobin (must correspond to the individual goal);
- blood pressure (less than = 140/80 mm Hg)
- the level of low-density lipoprotein cholesterol (less than 2.5 mmol / L or 1.8 mmol / L, depending on the risk of adverse cardiovascular events).

REFERENCES

1. Ametov A.S., Kochergina I.I. The role and place of domestic drugs Glyformin and Glimecomb in the treatment of type 2 diabetes mellitus // BC, Endocrinology. - 2011. - No. 27. - P.1678
2. Dedov I.I., Shestakova M.V., Galstyan G.R. Prevalence of type 2 diabetes mellitus in the adult population of Russia (NATION study). Diabetes. 2016. No. 2. P. 104–112.
3. Kondratieva L.V. Statins - an obligatory component of the treatment of type 2 diabetes mellitus // Attending physician. - 2013. - No. 3.
4. Runikhin A.Yu., Demidova I.Yu. Arterial hypertension in patients with type 2 diabetes mellitus: features of pathogenesis and treatment tactics // Farmateka.- 2012.- №5.
5. Yu.I. Suntsov Modern antihyperglycemic drugs used in Russia in the treatment of type 2 diabetes mellitus // Sakh. diabetes. 2012. No. 1. P. 6–10.
6. Emerging Risk Factors C., Di Angelantonio E., Gao P., Khan H., Butterworth A. S., Wormser D., et al. Glycated hemoglobin measurement and prediction of cardiovascular disease. JAMA. 2014.311 (12): 1225-1233.
7. Rydén L, Standl E, Bartnik M. et al. Guidelines on diabetes, pre-diabetes, and cardiovascular diseases: executive summary. The Task Force on Diabetes and Cardiovascular Diseases of the European Society of Cardiology (ESC) and of the European Association for the Study of Diabetes (EASD) // Eur Heart J. 2007 Jan; 28 (1): 88-136.
8. Zaccardi F., Pitocco D., Ghirlanda G. Glycemic risk factors of vascular complications: the role of glycemic variability // Diabetes Metab Res Rev. 2009, Mar; 25 (3): 199–207.
9. Dilshodov A.D., The name is quoted year of the main stages and features of the development of multimedia lectures in physics // Physics in the system of modern education (FSSO-15), 217-219 2015
10. 15. Dilshodov A.D., Ways to strengthen individualization of students' training in the process of teaching the course of electrical engineering and electronics // Physics in the system of modern education (FSSO-15), 9-11 2015



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