

Prevalence of Major Risk Factors for Cardiovascular Disease in Patients With Diabetes. Data from The Ukrainian Endovascular Register

Review Article

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Abstract

The analysis of the incidence of a number of risk factors for coronary heart disease in 2,700 people with angiographically documented coronary atherosclerosis in the electronic register of the Department of Interventional Cardiology in the period from September 1/09/2007 to 01/10/2012 was performed. Hypertension, dyslipidemia and multivessel coronary artery lesions were the most frequent in patients with DM. According to our data the most important risk factor for coronary artery disease in patients with diabetes in Ukraine is dyslipidemia, the incidence of which is 2.7 times higher than in the group of patients with coronary artery disease without diabetes.

Keywords: Diabetes Mellitus; Coronary Artery Disease; Hypertension; Dyslipidemia

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Introduction

Diabetes mellitus (DM), along with cardiovascular and cancer is one of the first places among the most serious diseases that afflict humanity. According to epidemiological studies of the incidence of diabetes has doubled every 15 years, by 2025, as predicted by the International Diabetes Federation (IDF) of their number will grow to 552 million, with 93-95% of patients included patients with type 2 diabetes. All over the world, and diabetes was the leading cause of blindness and kidney failure. In patients with DM in the 2-3, and according to some studies, up to 6 times higher risk of stroke and myocardial infarction [1]

The problem of diabetes is also relevant for Ukraine, where there are more than 1 million 280 thousand people suffering from diabetes, and every year the number increases progressively. Moreover, on the basis of epidemiological data and the results of comparing the prevalence of diabetes in our country to the rate in

neighboring countries, it can be assumed that the true prevalence of DM in Ukraine in 2-2.5, and probably 3 times more.

In addition, the CD has long been considered not only as an endocrine pathology, but as a disease that affects the cardiovascular system. Namely cardiovascular disease is a major focus for clinical medicine in diabetes. Found that 75-80% of people with diabetes die of cardiovascular disease (CVD), with 3/4 of these deaths occur in coronary heart disease (CHD), and others - for cerebrovascular disease and peripheral vascular disease. CVD is 4 times more common in people with diabetes than in those without diabetes, and 50% of patients at diagnosis of diabetes already have cardiovascular disease. These findings are reflected in the decision of the national educational experts of the U.S. program of cholesterol (NCEP ATP III) highlight diabetes as equivalent to coronary heart disease. Thus, all patients with diabetes are at high and very high risk of CVD. In addition, there is a tendency to "rejuvenation" of this disease, so about 50% of the diagnoses established CVD and 15% of deaths from cardiovascular disease occur in patients younger than 65 years.

However, the mechanisms that contribute to the high prevalence and severity of coronary artery disease on the background of diabetes, are so far poorly understood. To date are limited data on the characteristics of the pathogenesis of atherosclerosis in patients with diabetes, and found that in terms of diabetes is crucial - potentiation of the classic risk factors of atherosclerosis, or a fundamental change in its course with mechanisms specific to diabetes.

The main purpose of our study was to investigate the incidence and prevalence of major risk factors for cardiovascular disease in patients with diabetes and coronary artery disease based on the register interventional procedures department of endovascular surgery and interventional cardiology NSC "Institute of Cardiology after N.Strazhesko" NAMS of Ukraine

Materials and Methods

In order to determine the possible reasons for the higher frequency, severity and worse outcome of cardio-vascular disease in diabetic patients, we performed a comparative analysis of the incidence of a number of risk factors for coronary heart disease in 2,700 people with angiographically documented coronary atherosclerosis, 273 with DM (mostly DM type 2) and 2427 persons without DM. All surveyed persons were examined and / or treated at the department of endovascular surgery and interventional cardiology NSC "Institute of Cardiology after N.Strazhesko" NAMS of Ukraine in the period from 01.09.2007 to 1.10. 2012.

As a result of large prospective studies found that the "classical" risk factors for the development and progression of cardiovascular disease include hypertension, dyslipidemia, and smoking.

To study the frequency of the "classical" risk factors studied a cohort of patients with coronary artery disease, a registered medical practitioner Department of Interventional Cardiology and entered in the register of interventional procedures of the department.

Patients were further examined and interviewed to identify risk factors. For each patient included in the register, the doctor filled out an electronic map of the survey. When filling out an electronic map data used in history and objective examination of the patient, medical history, records of coronary angiography.

A statistical analysis of the data processing used contingency tables of two features 2x2 using the χ^2

Results

In the electronic register of the Department of Interventional Cardiology, NSC "Institute of Cardiology after N.Strazhesko" NAMS of Ukraine in the period from September 1/09/ 2007 to 01/10/2012 were included 2700 patients with coronary heart disease, including 273 diabetic patients, 2427 patients with coronary heart disease without DM or dysglycemia. According to the study, the incidence of diabetes among patients with cardiac disease is 10.1%, significantly higher than the prevalence of disease in the population of Ukraine, where, according to recent data, the figure is 2.8%. On the other hand, our result is much lower than the published data that patients with risk factors for disorders of carbohydrate metabolism rate is 10 to 50%. Dysglycemia is detected in 40-50% of patients hospitalized in the cardiology department. In a study of Euro Heart Survey on diabetes and the heart (EHS) diabetes was diagnosed in 31% of patients with coronary heart disease (CHD) and 22% of patients with acute coronary syndrome [2,3].

Among the total number of surveyed men were 2172 people, women on the roster, it was 528. Our data indicate that among the patients with diabetes, 28.6% were female that whereas in the group of patients with coronary artery disease without diabetes the percentage of women was lower and amounted to 18,5% ($p < 0.005$). Our findings confirm the existing opinion that women suffering from diabetes, cardiovascular disease develops more frequently than women without disorders of carbohydrate metabolism in history.

It is known that the risk factors for the development and progression of cardiovascular disease, characterized as reliably proven,

or leading, include hypertension, lipid disorders, smoking (UK-PDS, 1998-2004). On this basis, we analyzed the presence of the patients in both groups recognized risk factors such as hypertension, dyslipidemia, and smoking.

Based on data from the registry, hypertension was diagnosed in 262 of the 273 patients with DM, which was 95.9%. Of all the subjects with diabetes, only 11 patients suffering from diabetes, had a history of hypertension and did not require antihypertensive drugs. In patients without diabetes incidence of hypertension was also significant and was 67.4% (detected in 1635 of 2427 patients included in the registry). When comparing the incidence of hypertension in the two groups we surveyed showed a significant increase in the incidence of hypertension in patients with diabetes mellitus (95.9% compared to 67,4%, $p < 0.005$).

Lipid metabolism is now recognized as major risk factors for atherosclerotic lesions of the coronary, cerebral and peripheral vascular diseases. Based on this, we studied the incidence of dyslipidemia in patients in the two groups of analyzed patients and diabetic. Should indicate that dyslipidemia was found in 22.9% of all patients included in the registry (2700) and, thus, was the most common risk factor for coronary heart disease compared with hypertension and smoking, which are identified in 13.8% and 9,2% of subjects, respectively. In the analysis of the incidence of dyslipidemia in groups of patients who are suffering and not suffering from diabetes, we found that lipid disorders were found in 227 of 273 patients with diabetes, accounting for 83.2% and in 766 of 2427 patients without disorders of carbohydrate metabolism, ie in 31.6% of surveyed. Thus, when comparing the incidence of dyslipidemia in the two groups analyzed by us with a high degree of reliability revealed a significant increase in the frequency of occurrence of the lipid metabolism in patients with diabetes mellitus (83.2% compared to 31,6% $\chi^2 = 280,8$ $p < 0.005$). The frequency of this risk factor in patients with diabetes is 2.7 times higher than in the group of patients with coronary artery disease with no disorders of carbohydrate metabolism.

In the analysis of the incidence of smoking in the two groups being analyzed we found no significant difference in the number of smokers was almost equal in both groups, smoking is now 4.4% of patients with diabetes, and 4.9% of patients with coronary artery disease without diabetes ($p > 0.05$)

There is no doubt the severity of coronary artery disease in patients with diabetes is largely due morphological changes in the coronary vessels. In our earlier studies it was found that the atherosclerotic changes in the coronary arteries presented with simultaneous multivessel stenosis within the coronary arteries, multiple lesions with the location of stenosis in the proximal and distal part of the same vessel. In diabetic patients, the prevalence of hemodynamically insignificant stenosis and an increase in the number of fully occluded segments. [4]

We analyzed the frequency of occurrence of multiple coronary vessels in diabetic patients included in the registry. Thus, according to our data, the total number of patients with multivessel coronary lesions, diabetes 27.9%, with 3-vessel coronary vessels in patients with diabetes occurred in 16.8% of cases, and in 11.1% 2-vessel coronary vessels.

When comparing the frequency of single and multi-vessel coronary artery in patients with diabetic and we obtained the following data. We found that the loss of one of the coronary vessel was detected in 74 of 273 patients with diabetes, accounting for 27.1%

and in 537 of 2427 patients without disorders of carbohydrate metabolism, ie in 22.1% of the subjects. Thus, when comparing the incidence of single-vessel lesions in the two groups being analyzed we found no significant difference ($\chi^2 = 3,1$ $p > 0.05$). Multivessel coronary artery disease (2 or more of the vessel) was detected in 51 of 273 patients suffering from diabetes and 341 of 2427 patients without disorders of carbohydrate metabolism in history, representing 18.7% and 14,0% ($p < 0.05$).

Thus, on the basis of registry data, we can say that the frequency of diabetes in patients with cardiovascular disease, is 10.1%, ie one in ten patients having cardiac pathology, there is a disruption of carbohydrate metabolism. Women with diabetes, cardiovascular disease developed in 1.5 more likely than women without disorders of carbohydrate metabolism. When comparing the frequency of the "classical" risk factors for cardiovascular disease in patients included in the Register of Ukrainian Invasive Cardiology, suffering from diabetes, we found a significant increase in the incidence of the first risk factors such as hypertension and dyslipidemia.

In this case, the most common risk factor in the development and progression of cardiovascular disease in patients with diabe-

tes compared to patients with coronary artery disease without diabetes is hypertension, found in 95.9% of patients with diabetes. The second most common, but the most important risk factor for coronary artery disease in patients with diabetes is dyslipidemia, the incidence of which is 2.7 times higher than in the group of patients with coronary artery disease without diabetes. Multivessel coronary damage is 1.3 times more common in patients with diabetes compared to patients without diabetes.

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