EPIDEMIOLOGY AND RISK FACTORS OF CARDIOVASCULAR DISEASES AT THE PRESENT STAGE

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Abstract

At the beginning of the XXI century the main causes of death are recognized as non-communicable diseases. Among them the leading place is occupied by diseases of the circulatory system, from which about 17 million people die annually. In recent decades, ischemic heart disease is the main cause of mortality in most industrial countries of the world and, according to WHO, at the age of 50-54 years is 404-467 people per 100 thousand population [1,2].

Keywords: Myocardial infarction, mortality, risk factors, coronary heart disease.

Introduction

Myocardial infarction is one of the most frequent manifestations of ischemic heart disease and one of the frequent causes of death in developed countries. It is important to note that about half of deaths occur in the first hour from the onset of the disease. It is proven that the incidence of myocardial infarction increases significantly with age. Numerous clinical studies suggest that in women under 60 years of age, myocardial infarction is four times less common and develops 10-15 years later than in men [3,4,5].

On the basis of long-term prospective observations of practically healthy people and numerous epidemiologic studies conducted both in our country and abroad, a scientific concept of risk factors for coronary heart disease was developed. In essence, this concept, on the one hand, is the basis for the development of CHD, and on the other hand - actually became the foundation on which the modern provisions of prevention of this pathology stand. Currently, more than 200 different risk factors are known to influence the development of CHD. However, only 50-60 of them are actually associated with the development of pathology. For practice a much smaller number of risk factors are of importance. According to the WHO Expert Committee, the most important of them are:

1) dyslipidemia (elevated cholesterol, especially low-density lipoprotein cholesterol, low high-density lipoprotein cholesterol, elevated triglycerides);
2) smoking;
3) arterial hypertension;
4) obesity;
5) impaired glucose tolerance;

6) diabetes mellitus;

7) low physical activity;

8) hereditary predisposition;

9) sex and age of patients (over 55 years old for men, over 65 years old for women);

10) pathology of the blood coagulation [6,7,8].

CHD FRs are divided into two groups: factors that cannot be changed (non-modifiable) and factors that can be corrected (modifiable). The first group includes sex, age and heredity. It is known that men are more likely to suffer from IBS, and their disease occurs at a younger age. The risk of CHD for both men and women increases with age. Individuals with unfavorable heredity have an increased risk of getting sick. Such factors cannot be changed, but they should be taken into account in the formation of individual programs for the prevention of CHD [9,10].

Disorders of lipid metabolism, the main manifestation of which is an increase in the concentration of cholesterol in the blood, especially LDL cholesterol - the main factor in the development of atherosclerosis and CHD. The results of numerous epidemiologic studies have clearly shown that there is a direct correlation between cholesterol level and the probability of CHD, especially MI. The risk of CHD gradually increases at a plasma total cholesterol level of 4-5 mmol/l. The risk increases sharply if the concentration rises to 5.7-6.2 mmol/l and increases 4-fold if the concentration is 6.7 mmol/l and higher [6,7,8,9,10].

However, lowering blood cholesterol levels significantly reduces the likelihood of developing new cases of the disease. Cholesterol is found in the blood as part of lipoproteins. Thus LDL contain 60-70% of total cholesterol, HDL - 20-30%, very low density lipoproteins - 10-15%. And if an increase in LDL cholesterol indicates an increasing threat of atherosclerosis (2/3 of total cholesterol), on the contrary, an increase in HDL cholesterol (alpha-cholesterol) is considered as a factor counteracting atherogenesis (anti-atherogenic fraction of lipids). Triglycerides play a much smaller role in the development of CHD, but, despite this, their level should also be taken into account when conducting therapeutic and preventive measures. Atherogenic properties of blood lipoproteins depend on the ratio of total cholesterol and LDL-C, which should normally be less than 5. A higher value of this ratio indicates an increased risk and is the basis for correction of dyslipidemia even in mild hypercholesterolemia. Elevated triglycerides increase the risk of atherosclerosis when combined with hypoalphacholesterolemia [11,12,13,14,15,16].

Currently, an important risk factor for cardiovascular diseases is metabolic syndrome. MS is characterized by an increase in visceral fat mass, decreased sensitivity of peripheral tissues to insulin and hyperinsulinemia, which cause the development of disorders of carbohydrate, lipid, purine metabolism and arterial hypertension. The main sign of MS is the central (abdominal) type of obesity - OT more than >94 cm for men and >80 cm for women [15,16].

Additional criteria for MS include:

1) arterial hypertension (BP > 130/85 mmHg);

2) increased triglyceride levels (> 1.7 mmol/l);

3) decreased HDL-C (< 1.0 mmol/L in men; < 1.2 mmol/L in women);

4) elevation of LDL-C > 3.0 mmol/l;

5) fasting hyperglycemia (fasting plasma glucose > 6.1 mmol/L); 6) impaired glucose tolerance (plasma glucose 2 hours after glucose load within > 7.8 mmol/L and < 11.1 mmol/L).

The presence of central obesity and two additional criteria in a patient is the basis for diagnosing metabolic syndrome [14,16].

It is established that low physical activity is a risk factor for CHD. The probability of CHD development in sedentary people is on average 2 times higher than in physically active people. Sufficient physical activity has a multifaceted effect on the body and allows:

1) lower BP;

2) improve the lipid spectrum profile (decrease LDL-C and increase HDL-C);

3) reduce body weight;

4) improve glucose tolerance and reduce the risk of insulin-independent diabetes mellitus;

5) increase blood fibrinolytic activity;

6) prevent the occurrence of osteoporosis;

7) enhance mood;

8) reduce the severity of depression;

9) improve quality of life.

Physical activity is the movement of the body using muscles that results in energy expenditure. It is always important for a physician to get an objective idea of the true physical activity of their patient. A simple criterion has been proposed for the daily practice of physicians: physical activity is low if a person sits at work for 5 hours or more, and active leisure time in winter and summer, including the time spent walking to and from work, is less than 7-10 hours per week. During contacts with patients, the physician should assess the level of physical activity and find out their attitude to exercise. Patients should be motivated to increase physical activity, especially in daily life [1,3,5,7,9].

Each person should clearly know and control the safe heart rate zone during physical activity, which is 60-75% of the maximum HR, which is calculated according to the formula:

$$\text{HR max.} = 220 - \text{age (y.)}$$

For patients with CVD there are individual boundaries of the safe heart rate zone, which are determined by means of special testing (treadmill test or cycle ergometry at submaximal load) with the definition of an individual training heart rate to control the permissible intensity of loads.

In the literature concerning the role of alcohol in the development of atherosclerosis and CHD, both positive and negative associations between alcohol consumption and the occurrence of coronary artery disease have been described. In recent years, a direct relationship between per capita alcohol consumption and total mortality has been described. According to WHO, consumption of more than 8 liters of alcohol per year (in terms of pure ethanol) is dangerous: each additional liter reduces the total life expectancy of men by 11 months and women by 4 months [10,11,12,13].

It is proved that alcohol abuse dramatically increases mortality from CHD. Excessive alcohol consumption contributes to the development of CHD, primarily due to the potentiation of other factors. In particular, it has been established that alcohol abuse leads to an increase in BP, body weight, triglycerides level in blood, often combined with smoking, refusal of measures aimed at preservation and promotion of health. Long-term alcohol abuse induces the development of myocardiodystrophy and arrhythmia, increases clinical manifestations of heart and vascular

diseases, contributes to the damage of the liver and pancreas, nervous system, leads to social maladaptation [14,15].

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