Modern Methods of Diagnosis and Treatment of Diseases of Peripheral Arterial Vessels

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ABSTRACT

The overall prevalence of peripheral artery disease (PAD) or chronic obliterative arterial disease of the arteries of the extremities is 3+10% reaching 15 -20% among patients older than 10 years. A special feature of the PAD is the tendency to a steady progression of the process with a high frequency of amputations, disability, and lethality. As a result, the average life expectancy of these patients is about 10 years less than in people without signs of PAD.

Keywords: PAD, atherosclerosis, dyslipidemia

The relevance of the problem. The modern concept of diagnosis of peripheral artery disease is one of the urgent problems of modern medicine. Peripheral artery disease (PCA) is a pathology characterized by the formation of plaques in the peripheral arteries. As reported at the Scientific Session of the American Heart Association (ScientificSessionsoftheAmericanHeartAssociation) in 2007, the prevalence of asymptomatic ZPA in the adult population in the United States has been constantly increasing, and now it is found in about 5% of adults aged 40 years and older [1,6].

In addition, ZPA is an indicator of the condition of the arteries and its presence is associated with an increased risk of heart attack and stroke [10-11].

The epidemiology of diseases of the artery of the lower extremities has been studied in many countries, including Europe. According to a population-based study conducted in Sweden, the prevalence of lower limb artery lesion in people aged 60-90 years was 18%, and intermittent lameness was 7% [3]. One third of the patients had no clinical symptoms. The prevalence of critical limb ischemia was significantly lower than -0.4% [3]. The estimated annual incidence of critical limb ischemia varies from 500 to 1000 cases per 1 million population; it is higher in patients with diabetes mellitus.

The frequency of atherosclerosis of the artery of the lower extremities is closely related to age. It is low before the age of 50 and increases sharply in older age. The prevalence of lower limb artery disease differs in men and women, but the results of some studies indicate that this difference decreases with age. The incidence (the number of new cases) is also closely related to age. In the Framingham study, the incidence of intermittent claudication in men increased from 0.4 per 1,000 at the age of 35-45 years to 6 per 1,000 at the age of 65 years and older [5, 7]. In women, the incidence was about 2 times lower than in men, but it was similar in old age.

The purpose of the study. To improve the early diagnosis of ischemic stroke of the brain by developing and introducing into clinical practice a set of ultrasound methods.

Materials and methods. During the study, we conducted ultrasound examinations of 37 patients who had suffered from peripheral artery diseases, which were referred to the railway hospital in Urgench. Of these, 7 (19%) patients were under the age of 40, 20 (54%) patients under the age of 41-50, 10 (27%) patients aged 51 and over.

The echographic examination was carried out after a clinical examination on a Chison ultrasound device (China) with a 5.0 MHz linear convexmulti-frequency sensor. The study was conducted in Online mode. In the mode of color energy Doppler mapping, which allows visualization in color format throughout them, with measurement of the diameter of the vessels. Pulse-wave dopplerography technology was used to determine the blood flow rate. The assessment of quantitative characteristics of blood flow included the following indicators: maximum systolic blood flow rate (Vmax), maximum diastolic blood flow rate (Vmin), systolic-diastolic ratio, pulsation index (PI) and resistance index (IR).

Results. Based on the results of the conducted research, fundamentally new methods have been scientifically substantiated and developed and existing methods of ultrasound diagnosis of peripheral artery disease have been improved.As a result of the conducted research, important theoretical and practically significant data on the condition of peripheral vessels were obtained. It is difficult to predict future trends in the epidemiology of diseases of the arteries of the lower extremities, given changes in risk factors in the population, especially smoking and diabetes mellitus, as well as an increase in the survival rate of patients with coronary heart disease and stroke. The results of some studies published over the past few decades indicate a decrease in the incidence of intermittent claudication. Taking into account the general etiology of atherosclerosis of various peripheral arteries, the presence of vascular lesions in one basin increases the frequency of asymptomatic and clinically obvious atherosclerosis of another localization. From a clinical point of view, these data indicate that in patients with clinical manifestations of atherosclerosis, it is necessary to take into account the possibility of asymptomatic damage to other arteries. This is especially true for the elderly, who especially often have a combination of coronary heart disease, cerebrovascular disease and arterial disease of the lower extremities.

The risk factors for peripheral artery disease are similar to those of coronary heart disease and atherosclerosis in general. Traditional risk factors include smoking, dyslipidemia, diabetes mellitus and arterial hypertension. However, data on the association of these risk factors with atherosclerosis of some peripheral arteries are limited. In addition, certain risk factors may be more important in the development of atherosclerosis of some vessels, but comparative studies are few. Several epidemiological studies have established the important role of smoking in the development of arterial disease of the lower extremities; the revealed relationship depended on the intensity of smoking. Smoking is considered a more powerful risk factor for diseases of the arteries of the lower extremities compared with coronary atherosclerosis. In most studies, patients with intermittent lameness smoked or quit smoking. Smoking cessation is associated with a rapid decrease in the frequency of intermittent claudication, which after 1 year was similar to that of non-smokers [7]. Diabetes mellitus is another risk factor that is of particular importance in the development of atherosclerosis of the arteries of the lower extremities. First of all, this applies to severe atherosclerosis, accompanied by gangrene or ulceration, while in the case of intermittent lameness, the association with diabetes is comparable to that with coronary heart disease. The degree of risk depends on the duration and severity of diabetes mellitus. In most epidemiological studies, high levels of total cholesterol and low levels of high-density lipoprotein (HDL) cholesterol were independent risk factors for lower limb artery disease. Data on the role of other risk factors, such as obesity, alcohol consumption and plasma homocysteine levels, in the development of lower limb artery disease are

ambiguous. When studying the role of hemostatic, rheological and inflammatory markers, such as plasma fibrinogen levels and C-reactive protein, their independent relationship with the prevalence and incidence of atherosclerosis of the arteries of the lower extremities was revealed, although it remains unclear whether this association is primary or secondary. Genetic factors and other new biomarkers are currently being studied.

It is necessary to evaluate risk factors and known concomitant diseases, including arterial hypertension, dyslipidemia, diabetes mellitus, smoking, as well as the presence of cardiovascular diseases. When collecting anamnesis, symptoms of damage to various vessels should be identified: a family history of cardiovascular diseases, angina pectoris, symptoms that occur when walking (for example, fatigue, cramps or pain in the buttocks, hips, shins or feet), especially if they pass quickly at rest, any pain in the shins or feet that change in standing or lying down, poorly healing ulcers of the lower extremities.

Conclusions. Thus, to date, a large number of hemodynamic, rheological, immune and other risk factors for thrombosis have been described in the literature. New methods for assessing a patient's readiness for surgery are constantly being presented in medical literature, and the interpretation of the results of old tests is being revised. In this regard, it seems promising to create an integrated system for assessing the risk of early thrombotic complications, which includes the results of a number of the most reliable methods, capable of adapting to the emergence of new diagnostic methods and harmoniously integrating them into the existing prognostic algorithm.

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