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Changes in Cerebral Blood Vessels in Chronic Heart Disease

Hasanov Farrukhjon Sherali o'g'li

Assistant of the Department of Internal Diseases,

Samarkand State Medical University No. 1.

Mamadiyarova Dilfuza Umirzakovna.

Associate Professor, Department of Pedagogy, Psychology,

Samarkand State Medical University

Abstract: One of the most pressing problems of modern theoretical and practical medicine is such scientific views as changes in cerebral vessels in chronic coronary heart disease, as well as cerebrovascular changes, as well as frequent cardiovascular diseases of this Code. Among the main causes of such diseases, the most important is the prevention and effective treatment of the disease of arterial hypertension with further development based on social analysis.

Keywords: *cardiac ischemia, cerebrovascular, increased blood pressure, cardiovascular diseases of the brain, hypertension, cerebral stroke, epidemiology, atherosclerosis, diabetes mellitus.*

Introduction

Human existence is a unity of physiology, psychology, and social conditions. However, we are reluctant to acknowledge this unity, and instead, we study, understand, and act on them as separate fields and areas. This imbalance or incorrect dialectical interpretation not only hinders the development of humanity and the economy but ultimately reveals significant problems for human health.

From this perspective, functional or organic damage to the brain associated with cardiovascular diseases is referred to as cardio-cerebral changes. The brain constitutes 2% of the body weight and consumes 20% of the oxygen required by the body. If blood does not reach the brain cells for more than five minutes, they perish.

Cerebrovascular changes, i.e., brain disorders, often arise from cardiovascular diseases. Among the main causes of such diseases, the most significant is arterial hypertension (high blood pressure). The effect of increased blood pressure in causing cerebrovascular diseases is such that the higher the systolic and diastolic arterial blood pressure, the greater the risk of a brain stroke. An increase in renin levels in the blood serum, thickening of the myocardium (muscle) of the left ventricle of the heart, and the initial clinical signs of brain circulatory insufficiency are key indicators. Based on many years of research, the attacks observed in arterial hypertension, frequent fluctuations in blood pressure, high blood pressure at night, or its sudden drop also accelerate the development of cerebrovascular diseases.

METHODOLOGY

Cerebrovascular changes are of two types: acute and chronic cerebrovascular changes. Acute types of the disease include transient disturbances in brain circulation, where blood circulation in the brain is suddenly disrupted. Its symptoms resolve within 24 hours. Brain stroke is characterized by acute disruption of brain circulation with distinct focal clinical symptoms, persisting for more than 24 hours.

Chronic cerebrovascular diseases include the initial signs of brain circulatory insufficiency and discirculatory encephalopathy.

In these diseases, patients complain of headaches, dizziness, noise in the head, memory impairment, and reduced work capacity. As the disease progresses, subjective complaints increase, and objective neurological symptoms such as numbness in the limbs, weakness, trembling, imbalance, staggering while walking, and difficulty in movement also appear. The development of cerebrovascular changes is often associated with heart diseases. Conditions like ischemic heart disease, cardiac arrhythmias, myocardial infarction, and atherosclerosis accelerate the development of cerebrovascular disorders.

In particular, psycho-vegetative changes are frequently observed in patients with cardiovascular diseases. These changes manifest as depression, anxiety, panic, anosognosia (neglecting one's illness), and fear. To identify such changes in patients in a timely manner, specific medical tests are conducted. Based on the results, the physician initiates treatment.

We mentioned that the main cause of cerebrovascular changes is arterial hypertension. However, it is not possible to prevent these changes with antihypertensive medications alone. Nowadays, complex treatment methods are being used. For instance, in addition to antihypertensive medications, reflexotherapy, psychotherapy, drugs that improve cerebral blood circulation, nourish brain cells, and reduce lipid levels in the blood are being utilized. Patients with cerebrovascular changes caused by cardiovascular diseases can recover after treating the primary condition.

RESULTS

This condition, referred to as cardio-cerebral changes, involves the functional or organic impairment of the brain related to cardiovascular diseases. The brain constitutes 2% of the body weight but consumes 20% of the oxygen required by the body. If blood supply to the brain's cortical cells is disrupted for more than five minutes, they perish.

Cerebrovascular changes, i.e., brain diseases, often arise as a result of cardiovascular diseases. Among the main causes of such conditions, the most significant is arterial hypertension (high blood pressure). The impact of elevated blood pressure on the development of cerebrovascular diseases is as follows: the higher the systolic and diastolic blood pressure, the greater the risk of stroke. An increase in the renin level in blood serum and thickening of the myocardium (muscles) of the left ventricle of the heart are initial clinical signs of brain circulation insufficiency. According to years of research, hypertensive crises, frequent fluctuations in blood pressure, elevated nighttime blood pressure, or sudden drops in blood pressure also contribute to the rapid development of cerebrovascular diseases.

Cerebrovascular changes are of two types: acute and chronic cerebrovascular changes. Acute conditions include transient cerebrovascular disturbances. In this case, brain circulation is suddenly disrupted, and its symptoms resolve within 24 hours. Stroke, on the other hand, is characterized by acute disruption of brain circulation accompanied by specific focal clinical signs, which persist for more than 24 hours.

Chronic cerebrovascular diseases include the initial signs of brain circulation insufficiency and discirculatory encephalopathy. In such conditions, patients often complain of headaches, dizziness, tinnitus, memory loss, and decreased work capacity.

At the same time, it is necessary to provide information about hypertension.

Hypertension. High blood pressure, whether systolic or diastolic, has been identified as one of the key factors increasing the risk of atherosclerosis and ischemic heart disease through large-scale epidemiological studies. It has also been confirmed that the higher the blood pressure, the greater the risk of vascular pathologies such as epidemiological atherosclerosis.

Among individuals aged 45–62, arterial blood pressure of 160/95 mmHg or higher is considered significantly dangerous. When studying the prevalence of atherosclerosis in Uzbekistan, hypertension

was found in 38% of cases as a risk factor for ischemic heart disease among men and women. Moreover, it was determined that during the ages of 20–59, atherosclerosis is more closely associated with arterial hypertension.

It has also been determined that there is a clear connection between smoking and the onset of coronary heart disease, especially in the age range of 35 to 55.

Smoking 20 cigarettes daily increases the risk of developing coronary heart disease by three times compared to non-smokers. According to our data, in the 20-59 age group, complications caused by atherosclerosis in the aorta occur four times more frequently in smokers than in non-smokers. The surface area of the damage caused by atherosclerosis in the coronary arteries is significantly larger in smokers compared to non-smokers..

Diabetes mellitus is considered an important risk factor. The atherogenic effects of diabetes mellitus are more pronounced in women than in men. At the same time, it mainly affects the coronary arteries of the heart and major arteries. Patients with diabetes mellitus experience ischemic heart disease 6–8 times more frequently, and it begins earlier and progresses more severely. Notably, in patients with diabetes mellitus, while the amount of low-density lipoproteins (LDL) increases, the amount of high-density lipoproteins (HDL) decreases.

DISCUSSION

According to the results of our studies, diabetes mellitus was found as a risk factor for atherosclerosis in 11.9% of deceased women. At the same time, the presence of atherosclerosis was detected in patients with diabetes mellitus, whereas in people without diabetes, atherosclerosis was observed in 13.2% of cases in the descending coronary artery, in 20.6% of cases in the right coronary artery, and in 26% of cases in the circumflex left coronary artery.

In the 40–59 age group, diabetes mellitus has the most significant impact on the onset of atherosclerosis in the coronary arteries of the heart.

Other factors contributing to the risk of atherosclerosis include:

- lack of physical activity,
- unfavorable family conditions and related stress-inducing situations,
- prolonged use of contraceptive medications,
- hyperuricemia,
- consumption of soft drinking water,
- obesity.

As the disease progresses, subjective complaints increase, and objective neurological symptoms such as numbness in the limbs, weakness, tremors, imbalance, unsteady walking, and difficulty in movement appear. Cerebrovascular changes often arise due to heart diseases. Conditions like coronary artery disease, cardiac arrhythmias, myocardial infarction, and atherosclerosis accelerate the development of cerebrovascular disorders.

Psychovegetative changes are frequently observed in patients with cardiovascular diseases. These changes manifest as depression, anxiety, panic, anosognosia (lack of awareness of one's illness), and fear. To identify such changes in time, special medical tests are conducted, and based on their results, the physician begins treatment.

We mentioned that arterial hypertension is the primary cause of cerebrovascular changes. However, such changes cannot be prevented solely by antihypertensive medications. Currently, comprehensive treatment methods are being applied. For example, alongside antihypertensive drugs, reflexotherapy,

psychotherapy, medications that improve cerebral blood circulation, nourish brain cells, and reduce lipid levels in the blood are used.

Cerebrovascular changes caused by cardiovascular diseases can be managed effectively after the primary illness is treated, allowing the patient to recover.

Conclusion

In conclusion, chronic heart disease can lead to significant changes in the cerebral blood vessels, affecting brain function and increasing the risk of various neurological disorders, including stroke, cognitive decline, and dementia. Early diagnosis and management of heart disease are crucial in preventing or minimizing these cerebral complications.

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