



## METHODS FOR PREVENTING CHANGES IN BRAIN DISEASES

**Tolmasov Ruzibek Tolmasovich**

**Tashkent State Medical University**

**Senior Lecturer PhD of the Department of Human  
Anatomy and OSTA**

[ruzibektolmasov@gmail.com](mailto:ruzibektolmasov@gmail.com)

**Abdukhalimov Amriddin Abdurakhimovich**

**Tashkent State Medical University Treatment**

**Case No. 2 Faculty student**

**Khodjamova Gulbahor Adkhamovna**

**Tashkent State Medical University senior lecturer**

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### ABSTRACT

*The brain is the fundamental part of the central nervous system, controlling all physiological and cognitive processes of the body. In recent years, the increase in diseases such as Alzheimer's, Parkinson's, and stroke has increased the importance of preventive measures. Scientific research indicates that alongside genetic factors, lifestyle and environmental factors also exert a significant influence on the development of these diseases.*

**Introduction:** Today, brain diseases are considered one of the most common problems worldwide, significantly affecting human quality of life and life expectancy. Changes in modern lifestyles, particularly increased stress, poor nutrition, decreased physical activity, the widespread prevalence of harmful habits, and the deterioration of the ecological environment, are negatively impacting brain function. As a result, the number of diseases such as stroke, neurodegenerative diseases, and cerebrovascular disorders is increasing.

The issue of not only treating but also preventing these diseases among the population is becoming increasingly important. This is because brain diseases can often lead to disability, decreased work capacity, and even premature death. The increasing number of problems related to the nervous system, especially among young people, increases the relevance of this topic.

Therefore, the prevention of brain diseases, the early detection and elimination of factors contributing to their development, the formation of a healthy lifestyle, and the widespread implementation of preventive measures are among the priority areas of modern medicine. This topic is of particular importance for strengthening public health, reducing the burden of diseases, and having a positive impact on the socio-economic development of society.

**Research objective:** It consists of scientifically substantiating the mechanisms of development of pathologies such as brain diseases, Alzheimer's disease, Parkinson's disease, and stroke, as well as analyzing effective preventive measures aimed at their prevention.

**Discussions:** The brain is the most vital part of the central nervous system, controlling human thinking, memory, actions, and emotional states. In recent years, the widespread prevalence of diseases such as Alzheimer's disease, Parkinson's disease, and stroke has made the issue of their prevention urgent. Scientific research indicates that not only hereditary factors but also lifestyle, nutrition, physical activity, and mental state play a crucial role in the development of these diseases.

One of the primary pathophysiological mechanisms of brain diseases is the process of neurodegeneration. In this process, nerve cells gradually die and their connections are disrupted. In addition, factors such as oxidative stress and inflammatory processes also damage brain tissues and accelerate the development of diseases. Therefore, the primary goal of preventive measures is to reduce these harmful processes.

One of the important scientifically proven preventive factors is healthy nutrition. In particular, a diet based on the principles of the Mediterranean diet is effective in maintaining brain health. Such a diet includes a large amount of vegetables and fruits, fish products, olive oil, and nuts. The antioxidants in these products neutralize free radicals, while omega-3 fatty acids strengthen connections between neurons.

Physical activity also has a positive effect on brain function. Regular exercise increases neuroplasticity and enhances the flexibility of brain cells. At the same time, they stimulate BDNF production, which supports the growth and survival of neurons. As a result, cognitive functions improve and the risk of diseases decreases.

Monitoring the state of the cardiovascular system is also important in the prevention of brain diseases. High blood pressure, diabetes, and elevated cholesterol levels negatively affect cerebral blood vessels and increase the risk of stroke. Therefore, it is important to maintain a healthy lifestyle, undergo medical examinations, and receive treatment if necessary.

Maintaining mental activity is also one of the important scientifically grounded approaches. According to cognitive reserve theory, the more a person engages in mental activity, the more resistant their brain becomes to injuries. Reading books, learning new languages, and playing logic games stimulate brain activity and slow down cognitive decline.

Sleep also plays an important role in brain health. Scientific research indicates that the glymphatic system activates during sleep to eliminate harmful substances from brain tissues. In the absence of sufficient sleep, this process is disrupted and toxic substances accumulate, which increases the risk of neurodegenerative diseases.

Stress management is also an important part of prevention. Chronic stress results in elevated cortisol levels, which negatively affects brain cells, especially areas associated with memory. Meditation, relaxation exercises, and maintaining psychological balance can help reduce this risk.

**Conclusion:** The prevention of brain diseases is a multifactorial and complex process that includes biological, social, and lifestyle factors. Scientific evidence suggests that a healthy diet, physical and mental activity, quality sleep, stress management, and medical supervision can significantly reduce the risk of neurodegenerative and vascular diseases. Therefore, consistent use of prevention strategies throughout life is the most effective way to maintain long-term brain health

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