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NERVOUS SYSTEM

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ANNOTATSIYA:

The article reveals the structure and significance of the nervous system, which includes the central (the brain and spinal cord) and peripheral parts. It describes the structure of the neuron — the basic unit of the nervous system — and explains how neurons ensure communication between organs and coordinate the functioning of the entire body. The article also provides descriptions of common nervous system diseases such as neuralgia, neuritis, radiculitis, poliomyelitis, and stroke, outlining their causes, symptoms, and consequences. Additionally, the article emphasizes the importance of modern neuroscience research and preventive care in maintaining nervous system health. The article concludes with recommendations for prevention and strengthening of the nervous system: maintaining a daily routine, getting enough sleep, eating a balanced diet, avoiding bad habits, engaging in physical activity, managing stress, and getting vaccinated.

homeostasis,
neurotechnology

Introduction

The nervous system is a complex system of organs that regulates the functioning of the entire body and ensures communication between its parts. It consists of the central and peripheral nervous systems. The central nervous system includes the brain and spinal cord, while the peripheral system consists of nerves connecting the CNS with all organs and tissues.

The main structural and functional unit of the nervous system is the neuron. Each neuron consists of a cell body, an axon, and dendrites. The bodies of neurons form gray matter, while their processes make up white matter and nerves.

According to their functions, neurons are divided into sensory, motor, and interneurons.

• Sensory neurons transmit signals from the sense organs to the brain and spinal cord.

• Motor neurons carry impulses from the brain to muscles and organs, causing movement and organ activity.

• Interneurons connect sensory and motor neurons, ensuring the transmission of impulses within the central nervous system.

The nervous system not only controls all processes of the body but also plays a vital role in perception, thinking, emotions, and human behavior. It helps maintain balance in the internal environment — homeostasis — ensuring that all organs work harmoniously.

Recent advances in neuroscience and neurotechnology have made it possible to study brain activity more accurately. Modern tools such as MRI (Magnetic Resonance Imaging), EEG (Electroencephalography), and brain-computer interfaces allow scientists to understand how the brain processes information, reacts to stimuli, and recovers after injuries.

Diseases of the Nervous System

Diseases of the nervous system vary and may affect both the central and peripheral divisions. These include neuralgia, neuritis, radiculitis, and poliomyelitis.

Neuralgia is inflammation of sensory nerves, causing severe pain in the affected area. For example, inflammation of the trigeminal nerve results in pain in the face, eyes, and teeth.

Neuritis is inflammation of motor nerves. It can lead to muscle paralysis and facial asymmetry due to immobilization of one side of the face.

Radiculitis (sciatica) often occurs due to compression of the nerves emerging from the lumbar or sacral regions of the spine. The causes of this disease include exposure to cold or excessive strain on the spine.

Poliomyelitis (infantile paralysis) is caused by a viral infection that affects motor neurons. As a result, muscles may partially or completely lose their ability to contract, leading to partial or complete paralysis of the affected body parts.

Diseases of the brain such as stroke are among the most dangerous. Hypertension (high blood pressure) and atherosclerosis (narrowing of blood vessels) can cause impaired blood circulation in the brain, leading to a hemorrhage — a stroke — due to the rupture of capillaries. As a result, the supply of oxygen and nutrients to the brain decreases, and its functioning is disrupted. Damage to motor centers in the brain may lead to complete paralysis.

In addition, chronic stress and lack of sleep negatively affect the nervous system. Long-term stress increases the production of the hormone cortisol, which exhausts neurons and can lead to memory problems, irritability, and depression.

Prevention and Treatment

To maintain a healthy nervous system, it is important to lead a healthy lifestyle: follow a daily routine, get enough sleep, and avoid stress and overexertion. Proper nutrition is also essential — the diet should include B vitamins, magnesium, potassium, and healthy fats that strengthen nerve cells.

In cases of neuralgia and neuritis, physiotherapy, massage, vitamin therapy, and medical treatment prescribed by a neurologist are helpful.

For radiculitis and osteochondrosis, it is important to avoid hypothermia, distribute physical loads correctly, and perform therapeutic exercises. Preventing poliomyelitis requires timely vaccination.

To prevent brain diseases such as stroke, one should monitor blood pressure and cholesterol levels, and avoid smoking and alcohol.

Good sleep — at least 7–8 hours a night — is crucial, because during sleep the brain restores energy and processes information received during the day.

Modern medicine also uses neurorehabilitation — a set of special exercises, computer programs, and electrostimulation — to help patients recover after brain injuries and strokes.

A healthy lifestyle, moderate physical activity, emotional balance, and timely medical treatment are the best ways to preserve the health of the nervous system.

Conclusion

The nervous system plays a crucial role in the functioning of the human body, ensuring communication between all its parts, coordination of movements, perception, thinking, and behavior.

Diseases of the nervous system can seriously affect health and quality of life; therefore, timely prevention and medical care are essential.

Maintaining the health of the nervous system requires following a daily routine, getting enough sleep, eating a balanced diet, avoiding bad habits, and engaging in regular physical activity.

Modern advances in neuroscience and neurotechnology offer new opportunities for the diagnosis, treatment, and rehabilitation of nervous system disorders.

Thus, a healthy lifestyle, emotional balance, and careful attitude toward one's body form a reliable foundation for the proper functioning and longevity of the nervous system.

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