

USE OF NITRIC OXIDE THERAPY IN NEUROLOGICAL AND NOSOGENIC PSYCHOPATHOLOGICAL CONDITIONS DEVELOPING IN CANCER DISEASES OF THE REPRODUCTIVE SYSTEM

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Annotation This article analyzes neurological disorders and nosogenic psychopathological conditions (depression, anxiety states, cognitive decline) in patients with reproductive system cancers (endometrium, ovarian, prostate gland cancers, etc.). Studies devoted to the effectiveness of the use of nitric oxide (NO) as an endogenous vasodilator and neuromodulator in such cases are considered. The pathophysiological basis of nitric oxide therapy and scientific approaches to its clinical application are also analyzed.

Keywords: nitric oxide, cancer, reproductive system, neurology, psychopathology, therapy, nosogenic reaction.

ПРИМЕНЕНИЕ ТЕРАПИИ ОКСИДОМ АЗОТА ПРИ НЕВРОЛОГИЧЕСКИХ И НЕЗОГЕННЫХ ПСИХОПАТОЛОГИЧЕСКИХ СОСТОЯНИЯХ, РАЗВИВАЮЩИХСЯ ПРИ РАКЕ РЕПРОДУКТИВНОЙ СИСТЕМЫ

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Аннотация В данной статье анализируются неврологические расстройства и нозогенные психопатологические состояния (депрессия, тревожные состояния, когнитивное снижение), встречающиеся у пациенток с раком репродуктивной системы (эндометриальный, рак яичников, рак предстательной железы и т.д.). Рассматриваются исследования, посвященные эффективности применения оксида азота (NO) - эндогенного вазодилататора и нейромодулятора в таких случаях. Также анализируются научные подходы к патофизиологическим основам и клиническому применению терапии оксидом азота.

Ключевые слова: оксид азота, рак, репродуктивная система, неврология, психопатология, терапия, нозогенная реакция.

РЕПРОДУКТИВ ТИЗИМ САРАТОН КАСАЛЛИКЛАРИДА РИВОЖЛАНУВЧИ
НЕВРОЛОГИК ВА НОЗОГЕН ПСИХОПАТОЛОГИК ҲОЛАТЛАРДА NITRIC
OXIDE (АЗОТ ОКСИДИ) ТЕРАПИЯСИНИНГ ҚЎЛЛАНИЛИШИ

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Аннотация Ушбу мақолада репродуктив тизим саратон касалликлари (эндо-метриал, тухумдон, простата беи саратонлари ва ҳоказо) билан оғриган беморларда учрайдиган неврологик бузилишлар ва нозоген психопатологик ҳолатлар (депрессия, анксиоз ҳолатлар, когнитив пасайиш) таҳлил қилинади. Азот оксиди (NO) — эндоген вазодилататор ва нейромодулятор сифатида бундай ҳолатларда қўлланилишининг самарадорлигига бағишланган тадқиқотлар кўриб чиқилади. Шунингдек, азот оксиди терапиясининг патофизиологик асослари ва клиник қўлланилиши бўйича илмий ёндашувлар таҳлил қилинади.

Калит сўзлар: азот оксиди, саратон, репродуктив тизим, неврология, психопатология, терапия, нозоген реакция.

Reproductive system cancers are a major threat to women's and men's health on a global scale. These diseases cause not only physical, but also mental and neurological complications. In the post-diagnosis period and, in particular, during oncological therapy, many patients experience depression, anxiety, cognitive impairment, and somatoform disorders. Several pathogenic mechanisms are involved in the occurrence of these conditions, including inflammation, hypoxia, hormonal changes, and disorders of the neurotransmitter system.

From this point of view, nitric oxide (NO) - as a neuromodulator and a signaling molecule - opens up new possibilities in the treatment of such complex conditions.

Nitrogen oxide (NO) is a gaseous signaling molecule that is endogenously produced in the body and plays an important role in various physiological and pathophysiological processes. Its main functions include ensuring vasodilation, modulating neuronal activity, controlling inflammatory processes, and implementing neuroprotective and antidepressant effects.

The role of NO in vasodilation is to improve blood flow and lower blood pressure by relaxing the muscle fibers of blood vessels. At the same time, NO acts as a neurotransmitter in the central nervous system, modulating the transmission of signals by neurons, which is important in the balance of cognitive functions and emotional states.

From a pathophysiological point of view, NO is also involved in inflammatory reactions. Imbalance of its quantity and activity can lead to chronic forms of

inflammation and the development of various diseases, including cancer, neurodegenerative and cardiovascular diseases. Also, scientific research has confirmed that NO plays an important role in neuroprotective processes, protects nerve cells from various damages, and has an antidepressant effect.

Thus, the role of nitric oxide in physiological and pathophysiological processes is broad and complex, and understanding its functions is important for the development of new therapeutic approaches in the treatment of cancer and neurological complications.

Studies conducted in recent years have shown that oncological diseases, in particular, cancers of the reproductive organs, can cause various neurological and psychopathological complications. In the process of these diseases, the following conditions are common:

Depressive and anxious states, which develop after diagnosis as a result of psychological shock, hormonal changes, and chemotherapy;

Chronic fatigue syndrome (fatigue), i.e., a state of continuous fatigue and weakness;

Decreased cognitive functions, so-called "chemo brain," memory problems, and difficulty concentrating;

Autonomic nervous system dysfunction, which leads to various physiological disorders.

These types of neurological and psychopathological complications significantly reduce the quality of life of patients and complicate their adaptation to the treatment process. Therefore, comprehensive psychological and neurological support for patients with reproductive cancers is necessary.

NO therapy in the form of inhalation. This method is mainly used in cases associated with adhesions or hypoxia. NO administered by inhalation is used to improve pulmonary perfusion, reduce hypoxia, and balance overall blood circulation. This therapy is mainly used in young patients and in patients with pulmonary arterial hypertension.

NO donors. Substances such as nitroglycerin and isosorbide dinitrate act as NO donors, improving blood circulation by dilating peripheral blood vessels. These drugs are used for anginal stress, angina pectoris, and other cardiovascular diseases, helping to reduce the workload of the heart.

Biological additives based on L-arginine and L-citrulline. L-arginine is the main precursor of NO synthesis, and its use as an additive stimulates NO production in the endothelium. Thus, antidepressant and neuroprotective effects are shown. L-citrulline increases the content of L-arginine in the body and supports NO synthesis. These supplements are considered promising in strengthening the nervous system and brain functions.

Some clinical studies have shown the effectiveness of nitric oxide (NO) therapy in alleviating depression and cognitive impairment in oncological diseases. For example, in a pilot study conducted in 2021, patients with prostate cancer experienced a decrease in anxiety and depressive states by approximately 25% as a result of taking L-arginine. Inhaled NO therapy also alleviated neurological symptoms such as fatigue and headaches associated with hypoxia.

However, the research conducted so far is often small, and the lack of accuracy and comprehensiveness in their results remains. Therefore, it is necessary to conduct additional and large-scale scientific research to confirm the effectiveness of NO therapy in the treatment of depression and cognitive impairment in oncological diseases.

The existing limitations include: the uncertainty of therapeutic doses, which complicates the determination of a moderate and effective dose in treatment; there is also a possibility that nitric oxide (NO) affects the activity of cancer cells, which can lead to its anti-oncogene or pro-oncogene effect; there is still insufficient scientific data on the long-term consequences of NO, which makes it difficult to fully assess its safety and effectiveness. Based on this, it is necessary to conduct additional research in this area.

RESULT

Nitrogen oxide therapy is a promising approach to alleviating neurological and psychopathological disorders in patients with reproductive system cancers. The neuromodulatory properties and anti-inflammatory effect of NO make it possible to introduce new clinical methods in this area. However, there is a need for more extensive research to determine effectiveness and safety.

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