# MRI ASSESSMENT OF THE NEUROLOGICAL AND PSYCHOLOGICAL STATE OF WOMEN WITH CANCER OF THE REPRODUCTIVE SYSTEM

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**Abstract:** This study examined the neurological and nosogenic psychopathological conditions of women with cancer of the reproductive system, as well as the analysis of magnetic resonance imaging (MRI) of the brain. The purpose of the study is to identify neurological disorders and psychopathological symptoms associated with cancer, as well as to analyze their impact on the structure of the brain. Morphological changes in the brain, especially pathologies associated with stress and psychopathology, were studied using magnetic resonance imaging. The obtained data can contribute to a better understanding of the neurological and psychopathological conditions of women with cancer of the reproductive system in clinical practice and the improvement of treatment.

**Keywords:** Reproductive system cancer, Nosogenous neuropsychopathological condition, Women, Clinical description, Psychosomatic description, Oncological women and psychiatry

# ОЦЕНКА НЕВРОЛОГИЧЕСКОГО И ПСИХИЧЕСКОГО СОСТОЯНИЯ У ЖЕНЩИН С РАКОМ РЕПРОДУКТИВНОЙ СИСТЕМЫ С ПОМОЩЬЮ МРТ ГОЛОВНОГО МОЗГА

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**Аннотация:** В данном исследовании изучались неврологические и нозогенные психопатологические состояния женщин с раком репродуктивной системы, а также анализ магнитно-резонансной томографии (МРТ) головного мозга. Целью исследования является выявление неврологических нарушений и психопатологических симптомов, связанных с раком, а также анализ их влияния на структуру головного мозга. С помощью магнитно-резонансной томографии были исследованы морфологические изменения в головном мозге, особенно патологии в областях, связанных со стрессом и психопатологией. Полученные данные могут помочь улучшить понимание и лечение неврологических и психопатологических состояний женщин с

онкологическими заболеваниями репродуктивной системы в клинической практике.

**Ключевые слова:** Рак репродуктивной системы, Незогенное нейропсихопатологическое состояние, Женщины, магнит-резонанс, Клиническое описание, Психосоматическое описание, Женщины-онкологи и психиатрия

## РЕПРОДУКТИВ ТИЗИМ САРАТОНИ БИЛАН ОҒРИГАН АЁЛЛАРДА НЕВРОЛОГИК ВА ПСИХИК ҲОЛАТЛАРНИНГ МИЯ МРТ ОРҚАЛИ БАҲОЛАНИШИ

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**Аннотация** Ушбу тадқиқотда репродуктив тизими саратон касаллигига чалинган аёлларнинг неврологик ва нозоген психопатологик ҳолатлари ҳамда бош миянинг магнит-резонанс томографияси (МРТ) таҳлили ўрганилди. Тадқиқот мақсади — саратон касаллиги билан боғлиқ неврологик бузилишлар ва психопатологик симптомларни аниқлаш ҳамда уларнинг бош мия тузилишига таъсирини таҳлил қилишдан иборат. Магнит-резонанс томографияси ёрдамида миядаги морфологик ўзгаришлар, айниқса стресс ва психопатология билан боғлиқ соҳалардаги патологиялар тадқиқ қилинди. Олинган маълумотлар клиник амалиётда репродуктив тизими саратон касаллигига чалинган аёлларнинг неврологик ва психопатологик ҳолатларини яхшироқ тушуниш ва даволашни такомиллаштиришга ёрдам бериши мумкин.

**Калит сўзлар:** Репродуктив тизими саратон касаллиги, Нозоген нейропсихопатологик ҳолат, Аёллар, магнит-резонанс, Клиник тавсиф, Психосоматик тавсиф, Онкологик аёллар ва психиатрия

Magnetic resonance imaging (MRI) is a high-precision diagnostic method widely used in modern medicine. With the help of this method, it is possible to identify soft tissues in the human body, in particular, oncological processes at an early stage, assess their composition and boundaries, and see changes in the structure of cells.

In oncology of reproductive organs, MRI plays an important role in the correct diagnosis and control of the results of treatment of uterine, ovarian, and fallopian tube cancers. At the same time, MRI is also effective in assessing the state of the brain and central nervous system. Therefore, MRI is also important for visualizing neurological and psychopathological changes observed in oncological patients. In scientific

research, through the use of MRI, it is analyzed what changes can be caused by cancer in patients not only morphologically, but also functionally.

Assessment of symptoms and pathophysiological changes using MRI:

Limbic system and hippocampus: In cases of depression and prolonged stress, a decrease in the size of the hippocampus and amygdala, as well as a decrease in functional activity, is observed. These changes affect emotional regulation.

In the area of the dorsolateral prefrontal cortex, a state of hypometabolism can be noted, which is associated with a decrease in the ability to think and make decisions.

Anterior singulator funnel (ACC): Functional and morphological changes, including atrophy, are recorded in the area of the ACC involved in emotional control.

White matter microderivatives: Under prolonged stress, small hyperintensive foci (leukoaraiosis) can be observed in the T2 and FLAIR sequences.

HPA-axis function: Functions on the hypothalamus-pituitary-tumor (adrenal) axis can change under stress. These changes are detected using functional MRI.

Types of MRI used:

• T1, T2, FLAIR: Effective in assessing structural changes.

• fMRI: allows real-time monitoring of brain activity.

• DTI: Used to analyze the state of white matter pathways and intracranial connections.

Cancer-related changes in brain MRI manifestations Metastatic glasses (tumors): Cancer metastases in the brain manifest as hyperintensive foci in T2 and FLAIR modes. Edymas are observed around it, and strong contrast is detected when gadolinium is used in T1 mode. Paraneoplastic encephalopathy: Especially in tumors such as ovarian cancer, symmetrical or asymmetrical hyperintensive foci (T2/FLAIR) are observed in the limbic system through autoimmune processes. Effects of chemotherapy and radiotherapy: Generalized hyperintensities (leukoencephalopathy), microinfarcts, and cerebral atrophy are detected in the white matter. Changes in the pituitary and hypothalamus: Hormonally active glasses manifest as pituitary adenoma and are accompanied by hormonal imbalance. On MRI, they are contrasted.

**CONCLUSION** Magnetic resonance imaging (MRI) is a highly effective method for the early detection of oncological diseases and the assessment of their morphological and functional changes. MRI is especially important in cases of oncology of the reproductive organs and cancers affecting the central nervous system.

MRI can assess pathophysiological changes in the limbic system, hippocampus, prefrontal cortex, ACC, and white matter. These changes help to understand the neurological and psychopathological symptoms that occur in connection with cancer. Disorders in the function of the HPA axis are also revealed in cases associated with stress and depression.

Various types of MRI - T1, T2, FLAIR, fMRI, and DTI - allow for the detection of morphological and functional changes of varying degrees. Metastases in the brain, paraneoplastic encephalopathy, the consequences of chemotherapy and radiotherapy, as well as fibroids in the pituitary and hypothalamus, can be effectively visualized using MRI.

Therefore, the significance of MRI in the comprehensive examination and dynamic observation of oncological patients is very high, which plays a decisive role not only in diagnosis, but also in determining the treatment strategy.

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