ENDOMETRIOSIS: MODERN CONCEPTS OF ETIOLOGY, DIAGNOSIS, AND TREATMENT

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Annotation: Endometriosis affects approximately 10% of women of reproductive age – about 190 million people worldwide. At the same time, in many countries, an average of 7–10 years passes from the onset of the first symptoms to diagnosis. Endometriosis is a chronic gynecological disease in which tissue similar to the endometrium appears outside the uterine cavity. The disease is more common in women of reproductive age and can significantly affect quality of life. The main symptoms are severe pain during menstruation, chronic pelvic pain, pain during intercourse, as well as disorders of the intestines and urinary system. Endometriosis can also be associated with difficulty conceiving. The exact cause of the disease has not been fully established. Hormonal, immune, genetic, and inflammatory factors may be involved in its development. For diagnosis, medical history taking, gynecological examination, ultrasound, and, if necessary, MRI are used. In some cases, laparoscopy is used. Treatment is selected individually. It may include painkillers and hormonal medications, and in certain cases, surgical treatment. If pregnancy is planned, the doctor also considers the impact of the disease and treatment on reproductive function. Thus, endometriosis requires timely diagnosis and individualized treatment. The main goals of therapy are reducing pain, improving quality of life, and preserving reproductive health.

Keywords: endometriosis, gynecology, endometrium, pelvic pain, dysmenorrhea, infertility, diagnosis, ultrasound.

Introduction

Endometriosis is one of the most common chronic gynecological diseases and represents a significant medical and social problem. The disease is characterized by the presence of tissue similar to the endometrium outside the uterine cavity. The pathological process is most often localized in the pelvic organs, but in some cases endometriosis can also affect other organs. According to the World Health Organization, about 10% of women of reproductive age suffer from endometriosis, which corresponds to approximately 190 million people worldwide. The disease can manifest as severe menstrual pain, chronic pelvic pain, pain during sexual intercourse, disorders of the intestines and urinary system, as well as infertility [1; 2025].

The relevance of studying endometriosis is due not only to the high prevalence of the disease but also to the significant impact of its symptoms on patients' quality of life. Chronic pain can lead to reduced physical activity, sleep disturbances, emotional stress, and difficulties in studies or professional activities. In addition, endometriosis can be accompanied by impaired reproductive function.

The aim of this work is to review modern concepts of endometriosis, its etiology and pathogenesis, clinical manifestations, diagnostic methods, treatment, and the impact of the disease on reproductive health [2; 2022].

Endometriosis is a chronic disease in which tissue similar to the endometrium is found outside the uterine cavity. Most often, pathological foci are located on the pelvic peritoneum, ovaries, fallopian tubes, the outer surface of the uterus, the bladder, and the intestines. In rare cases, endometriotic foci can be found outside the pelvic organs [1; 2025]. Endometriosis is an estrogen-dependent disease. Endometriotic foci are able to respond to hormonal changes occurring during the menstrual cycle. As a result, inflammatory reactions, hemorrhages, and subsequent formation of fibrous tissue and adhesions develop in the pathological foci.

The prevalence of the disease is difficult to determine with absolute accuracy, since its diagnosis can take a long time. The symptoms of endometriosis are extremely diverse, and the severity of pain does not always correspond to the extent of the pathological process. This is why in some patients the disease is diagnosed only several years after the onset of the first symptoms. WHO emphasizes that delayed diagnosis is one of the important problems associated with endometriosis. One of the reasons may be the mistaken perception of severe menstrual pain as a normal phenomenon [1; 2025].

The exact cause of endometriosis has not been definitively established to date. Modern concepts consider the disease as a multifactorial pathological process in which hormonal, immunological, genetic, and inflammatory mechanisms may be involved. One of the most well-known hypotheses is the theory of retrograde menstruation. According to this hypothesis, during menstruation, part of the menstrual blood and endometrial cells can enter the abdominal cavity through the fallopian tubes. However, retrograde menstruation alone does not explain the occurrence of endometriosis in all women, since it can also occur in people without the disease.

Currently, much attention is paid to disorders of the immune response. According to WHO, studies indicate a possible connection between endometriosis and impaired regulation of the immune system [1; 2025].

Hormonal factors are also important. Endometriotic tissue is sensitive to estrogens, which can support the growth and activity of pathological foci. In the foci of the disease, local inflammatory processes are observed,

accompanied by the release of various inflammatory mediators. Chronic inflammation contributes to the formation of adhesions and fibrous changes. Genetic predisposition is also considered one of the risk factors. The presence of endometriosis in close relatives may increase the likelihood of developing the disease [2; 2022]. In particular, modern NICE recommendations suggest taking family history into account when examining patients with symptoms characteristic of endometriosis [3; 2024]. Thus, endometriosis should be considered as a disease with a complex and multifactorial mechanism of development, rather than as a result of a single specific cause.

Depending on the localization of the pathological process, several main forms of endometriosis are distinguished. Peritoneal endometriosis is characterized by the location of foci on the pelvic peritoneum. It may be accompanied by inflammatory changes and the formation of adhesions. Ovarian endometriosis leads to the formation of endometriotic cysts, which are often called endometriomas. They can be of various sizes and are sometimes detected during ultrasound examination.

Deep infiltrating endometriosis is characterized by the penetration of the pathological process into tissues to a significant depth. It can affect the intestines, bladder, or ureters. In this form of the disease, an accurate assessment of the extent of the pathological process before possible surgical treatment is especially important. NICE recommends using specialized transvaginal ultrasound or magnetic resonance imaging when deep endometriosis is suspected. There are also rare forms of the disease in which endometriotic tissue is located outside the pelvis.

Various classification systems are used to describe the extent of endometriosis. However, the stage of the disease does not always reflect the severity of symptoms. Therefore, modern recommendations emphasize the need to focus not only on the anatomical extent of the disease but also on the symptoms, needs, and reproductive plans of the patient [3; 2024].

The clinical picture of endometriosis is highly diverse. In some patients, the disease may be almost asymptomatic, while in others, symptoms significantly disrupt daily life. One of the most characteristic manifestations is dysmenorrhea painful menstruation. In endometriosis, pain can be intense and lead to limitation of usual activities. Another common symptom is chronic pelvic pain, which can persist outside the menstrual period. Pain during or after sexual intercourse is also possible. When the intestines are affected, cyclic pain during defecation and other gastrointestinal symptoms may be observed. When the urinary system is affected, painful urination and, in some cases, cyclic hematuria are possible.

It is important to note that the intensity of pain does not always correspond to the stage of the disease. A patient with a relatively small number

of foci may experience severe pain, while with an extensive process, the pain syndrome may sometimes be less pronounced [3; 2024].

Diagnosis of endometriosis is based on the assessment of complaints, medical history, physical examination, and data from instrumental research methods . At the first stage, the doctor thoroughly clarifies the nature of the pain syndrome, the connection of symptoms with the menstrual cycle, the presence of disorders of the intestines and urinary system, as well as family history. Ultrasound examination plays an important role. According to updated NICE recommendations, transvaginal ultrasound is recommended for patients with suspected endometriosis even with normal physical examination results. It allows detecting endometriomas, signs of deep endometriosis, and other diseases of the pelvic organs.At the same time, a normal ultrasound result does not exclude the presence of endometriosis. If clinical symptoms persist, further examination may be required even in the absence of pathological changes on ultrasound. Magnetic resonance imaging is used primarily to assess deep endometriosis and determine its extent. MRI is especially important when intestinal, bladder, or ureteral involvement is suspected. Diagnostic laparoscopy has long been considered the main method of confirming the disease. However, modern recommendations consider diagnostic laparoscopy more selectively, taking into account imaging results and the clinical picture. ESHRE in its 2022 guideline notes changes in approaches to diagnostic laparoscopy compared with earlier recommendations [2; 2022].

Determination of CA-125 levels is not recommended as an independent method for diagnosing endometriosis. NICE explicitly states that serum CA-125 should not be used to make a diagnosis [3; 2024].

Conclusion

Endometriosis is a chronic multifactorial disease that is widespread among people of reproductive age and can significantly affect quality of life. Despite numerous studies, the exact causes of the disease have not been fully established to date. The main manifestations of endometriosis are painful menstruation, chronic pelvic pain, pain during sexual intercourse, cyclic symptoms from the intestines and urinary system, as well as impaired reproductive function [1; 2025].

Modern diagnosis is based on a combination of clinical assessment and imaging methods. Ultrasound examination occupies a significant place, and MRI may be used when deep endometriosis is suspected. At the same time, the absence of changes on ultrasound does not allow excluding the disease in all cases.

Treatment should be selected individually. Painkillers and hormonal medications are used to control symptoms, and surgical treatment is used in certain cases. If there are reproductive plans, the potential impact of the disease and treatment on fertility must be considered. Thus, the most important areas of

modern medical care for endometriosis are early recognition of symptoms, timely diagnosis, individual choice of therapy, and long-term follow-up. Increasing awareness among the population and medical professionals about the disease can contribute to earlier seeking of medical help and reducing the negative impact of endometriosis on quality of life.

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