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Research Article

EFFECT OF PHYSIOTHERAPY ON THE IMPLANTATION POTENTIAL OF THIN ENDOMETRIUM

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Kurbaniyazova Feruza Zafarjonovna
Assistant of the Department of Obstetrics and Gynecology №1, Samarkand State Medical University, Samarkand, Uzbekistan

Khudoyarova Dildora Rakhimovna
DcS, professor, head of the Department of Obstetrics and Gynecology №1, Samarkand State Medical University, Samarkand, Uzbekistan

ABSTRACT

The article is dedicated to the urgent problem of infertility associated with thin endometrium. The mechanisms of action of various physiotherapeutic methods on the endometrium, such as magnetotherapy, laser therapy, ultrasound therapy, and electrical stimulation, are discussed. The beneficial effects of physiotherapy are described in detail, including improved blood flow, reduced inflammation, and stimulation of tissue regeneration. The results of clinical trials confirming the effectiveness of physiotherapy in increasing the thickness and improving the structure of the endometrium are presented. The article also includes indications and contraindications for the use of physiotherapy and emphasizes the importance of an individualized approach to treatment.

KEYWORDS

Thin endometrium, physiotherapy, infertility, implantation, magnetotherapy, laser therapy, ultrasound therapy, electrical stimulation.

INTRODUCTION

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A thin endometrium is one of the most common causes of infertility in women. Insufficient thickness of the endometrium prevents successful implantation of the embryo, significantly reducing the chances of pregnancy. Physiotherapy, acting on various physical processes in the body, can be an effective treatment for thin endometrium. In this article, we will consider the mechanisms of action of physiotherapy, its types, effectiveness, and prospects of application in reproductive medicine. A thin endometrium is one of the most common causes of infertility in women. Insufficient thickness of the endometrium prevents successful implantation of the embryo, significantly reducing the chances of pregnancy. Physiotherapy, acting on various physical processes in the body, can be an effective treatment for thin endometrium. In this article, we will consider the mechanisms of action of physiotherapy, its types, effectiveness, and prospects of application in reproductive medicine.

The receptivity of the endometrium is a key factor in determining the success of embryo implantation. Implantation problems are one of the main causes of infertility. Reproductive disorders are quite widespread: up to 18% of couples are infertile [1, 2], half of them have to resort to the use of assisted reproductive technologies (ART) [3], up to 70% of cycles of in vitro fertilization (IVF) programs are ineffective [4, 5]; about 20% of women suffer from non-pregnancy, among them every fifth woman faces habitual reproductive losses [2]. Timely detection and correction of disorders of female reproductive function is a strategically important task of modern medicine [1, 2].

Endometrial receptivity is a complex process that depends on a set of genetic, hormonal, immunological, and morphological factors, the interaction of which determines the success of embryo implantation. Successful implantation is determined by a complex of structural and functional characteristics of the endometrium (genetic, proteomic, and morphological), united by the term "endometrial receptivity". The diversity of these factors emphasizes the complexity of the implantation process. Implantation is a multistage process of intermolecular and intercellular interactions, which are determined by the synchronous development of the embryo and endometrium. This interaction depends on a complex balance of various factors affecting endometrial receptivity [2, 4, 12, 14].

As emphasized in the study by Krylova Y.S. (2013) the endometrium in the natural cycle undergoes several morphological, cellular, and molecular changes necessary for the "opening" of the implantation window and the formation of the receptive state of the endometrium that ensures the implantation process. Currently, a large number of biologically active substances have been identified: growth factors, cytokines, adhesion molecules, and components of

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intercellular substance, the nature of their production varies depending on the stage of endometrial transformation and parameters of the implantation window [6].

Clinical studies show that uterine circulatory disturbances can lead to various pathologies such as hypertonicity, lack of blood flow, and others. These changes may hurt endometrial receptivity and complicate the implantation process. Uterine hemodynamics includes the blood supply to the uterus, which is carried out through the uterine arteries, as well as the microcirculation in the endometrium and myometrium. The importance of hemodynamics lies in the fact that it provides adequate nutrition to the endometrium, which is necessary to maintain its function, especially during the implantation phase.

Several factors directly affect uterine hemodynamics:

- Blood supply: Increased blood supply favors the formation of necessary factors for implantation such as hormones, cytokines, and other bioactive substances.

- Tissue oxygenation: Adequate blood flow ensures adequate oxygen supply to the endometrium, which is crucial for cellular metabolism and function.

- Nutrients: Blood carries essential nutrients that the endometrium uses to prepare for implantation. Studies show that women with impaired uterine hemodynamics often have implantation problems as well as an increased risk of miscarriage.

Mechanisms of action

- Improved blood circulation: Physiotherapy stimulates blood flow in the uterus, ensuring adequate nourishment of the endometrium.

- Reducing inflammation: The treatments reduce inflammation, creating a favorable environment for implantation.

- Stimulation of regeneration: Physiotherapy activates tissue repair processes, promoting the thickening of the endometrium.

Types of physiotherapy

Magnetotherapy: Low-frequency magnetic fields improve blood circulation and metabolism.

Laser therapy: Laser radiation stimulates cellular activity and regeneration.

Ultrasound therapy: Ultrasound improves microcirculation and cell membrane permeability.

Electrical stimulation: Electrical currents stimulate uterine muscle activity and improve blood supply.

Studies show that physiotherapy increases the thickness of the endometrium, improves its structure and increases the chances of pregnancy. However, the

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effectiveness depends on individual characteristics of the body and concomitant diseases.

Indications and contraindications

Indications: Thin endometrium, chronic endometritis, postoperative conditions.

Contraindications: Acute inflammatory processes, cancer, pregnancy.

Physiotherapy is often combined with other treatment methods to achieve better results. The physiotherapy programme is selected individually for each patient. Physiotherapy can be used to prevent thin endometrium and pregnancy complications.

Benefits of physiotherapy:

- Painlessness

- Absence of side effects

- Possibility of outpatient treatment

Физиотерапия – это надежда для многих женщин, столкнувшихся с проблемой бесплодия, связанной с тонким эндометрием.

CONCLUSION

Physiotherapy is a safe and effective method of treating thin endometrium. It improves the conditions for embryo implantation and increases the chances of pregnancy. However, it is necessary to consult a doctor before starting treatment.

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