

# Rehabilitation of Endometrial Receptivity in Patients with Different Morphological Types of Chronic Endometritis

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## Abstract

A study of the local immune profile of 57 patients of reproductive age with different morphological types of chronic endometritis revealed a cellular and immune imbalance in the endometrium, causing a decrease in its receptivity. The use of laser-magnetic vaginal exposure contributed to a decrease in the expression of estrogen receptors in the stromal and glandular components of the endometrium. The best results of the regulation of the ratio of steroid receptors of the endometrium were achieved in hyperplastic and fibrous morphological type of chronic endometritis due to the relief of tissue reception disorders and the regulation of the endometrial gravidar transformation.

**Keywords:** Chronic Endometritis; Endometrial Receptivity; Vaginal Laser-Magnetopuncture.

## Abbreviations

CE: Chronic Endometritis; IHCI: Immuno Histo Chemical Tests Of The Endometrium; PID: Pelvic Inflammatory Disease

## Introduction

Currently, chronic endometritis (CE) acquires not only medical, but also social significance, being the cause of infertility and disrupting reproductive function in women [1]. The proportion of CE in comparison with pelvic inflammatory disease (PID) ranges from 0.2 to 66.3% [2]. In most cases (76-88%), CE occurs at fertile age, courses disorders not only in the reproductive function, but also in the functions of the other systems. As a result, there is a disbalance in the receptor profile of the endometrium, namely, the number of functionally complete receptors determines the normal endometrial transformation necessary for successful implantation and pregnancy [3,4]. In addition, chronic inflammation in the endometrium leads to disadaptation of local immunity, activation of lymphocytes, which causes perverted hormone perception in the form of "thin" endometrium, fibrosis, polyposis and endometrial hyperplasia [5].

The aim was to evaluate the effectiveness of preformed factors in the rehabilitation of endometrial receptivity in patients with different morphological types of chronic endometritis based on the study of local immune profile.

The objects included the analysis of data of histological and immunohistochemical tests of the endometrium, with the study of the morphological type of endometritis, as well as the identification of cellular and immune imbalance in the endometrium with the evaluation of the receptivity markers of endometrium stroma and glands, to determine the effectiveness of a complex method of rehabilitation vaginal laser-magnetopuncture.

## Materials and Methods

57 patients aged 18 to 44 years with CE and reproductive dysfunction were examined. All patients underwent hysteroscopy with endometrial biopsy on the 7th-10th day of the menstrual cycle. The data of histological and immunohistochemical tests of the endometrium (IHCE) were analyzed. The following parameters were evaluated: morphological type of endometritis, for which the biopsy materials were fixed in 10% neutral formalin, enclosed in paraffin, made sections 5 microns thick and stained with hematoxylin and eosin. Immunohistochemical study of estrogen and progesterone receptor expression in the stroma and epithelium of the endometrium was performed in stepped paraffin sections with peroxidase-antiperoxidase method. The following primary antibodies were used: on alpha-estrogen receptors (clone ID5), on progesterone receptors (clone PgR 636) on plasma cells (CD138) (clone VS 38c), the PgR/ER coefficient, the level of T-lymphocytes (CD3), NK-cells (CD56) and the concentration of LIF were determined. All antibodies are produced by "Dako", Denmark, visualized system En Vision.

All women received vaginal laser-magnetopuncture on the unit KLM-01 "Androgin" in 2 days after operation (during postoperative period). In total, 7 procedures were performed.

Control pipel-endometrial biopsy followed by morphological and immunohistochemical tests was performed on the 7th-10th day of the next menstrual cycle.

Results and Discussion

Morphological study of 57 endometrial samples before treatment revealed fibrous form of CE in 10 (17.5%) patients, cystic - in 1 (1.8%), hyperplastic - in 30 (52.6%), hypoplastic - in 16 (28.1%) patients. The results of IHCE in patients with fibrous and cystic forms of CE showed a decrease in the PgR/ER ratio to 1 in the epithelium of the glands and to 0.48 in the endometrial stroma at a rate of 2.2 and 1.5 points. The study of the material on plasmocytes (CD138) determined nonspecific staining of epithelial and stromal components. T-lymphocytes (CD3) up to 6% in the form of perivascular clusters were isolated in the stroma in the superficial parts of the mucosa. There was a decrease in LIF by 20% (8 points at a rate of 10 points), a clone of CD56-positive lymphocytes (7-8% at a rate of 10% in the field of view). The hyperplastic form of chronic endometritis was characterized by a decrease in the PgR/ER ratio to 1 in the epithelium of the glands and in the stroma of the endometrium, nonspecific staining of epithelial and stromal cells in the study of the material on CD138. CD3 was detected as uneven scattering and perivascular clusters of up to 5% of stromal cells only. There was a decrease in LIF in the stromal component by 30% (7 points) and CD56 clone (6-7%). The hypoplastic form of chronic endometritis was characterized by a decrease in the PgR/ER coefficient to 0.97 in the epithelium of the glands and 0.41 in the stroma of the endometrium. Weak nonspecific staining of epithelial and stromal components on CD138 was noted. In the stroma in the superficial parts of the mucosa, an increased amount of up to 8% CD3 was released. There was a 20% decrease in LIF in the epithelial and stromal components. A clone of CD56 was determined above the norm (14-15%). Depending on the morphological type of chronic endometritis, the features of

IHCE indices were revealed. The clone of CD56 was higher than normal only in the hypoplastic type of CE, and in other variants of CE its content was lower than normal. CD138 plasma cells were determined in all morphological variants of CE, being less colored in hypoplastic type. The level of T-lymphocytes was the highest in the hypoplastic type, and the lowest - in the hyperplastic type, a decrease in LIF by 20-30% and the PgR/ER coefficient to 0.41 -1 in any type of morphological variant of CE indicate the intensity of the inflammatory process and the high activity of local immune processes occurring in the endometrium, contributing to a decrease in the receptivity of the endometrium with a violation of implantation.

After the laser-magnetopuncture, the number of CD138 WAS not determined in the group with hypoplastic type of CE, and in the groups with hyperplastic and fibrous type decreased from 8.5±1.5 to 4.2±0.7 and 7.9±2.1 to 4.7±1.4, respectively (p<0.05), which indicates a decrease in the adaptive imbalance in all morphological variants of CE. In addition, there was a decrease in the number of T-lymphocytes (CD3) in the stroma and mucosa in patients with hypoplastic type of CE by 1.6 times (from 8.2±1.4% to 5.1±1.6 %) (p<0.05), clone of CD56 by 1.4 times (from 14.5±1.2 to 10.1±0.6) (p<0.05). The number of CD3 cells in the groups of patients with hyperplastic and fibrous forms of CE did not change, and the number of CD56 increased from 6.2±1.1 to 9.8±1.3 and from 7.6±1.4 to 10.2±0.2, respectively (p<0.05). LIF expression after treatment increased in all groups of CE from 8.1±1.0 to 10.0±1.0 in glands and stroma from 8.3±1.6 to 9.5±1.6 (p<0.05).

The use of preformed factors in the treatment of patients with CE led to a decrease in the expression of estrogen receptors in the stromal and glandular components of the endometrium in all groups of the examined patients (Fig 1).

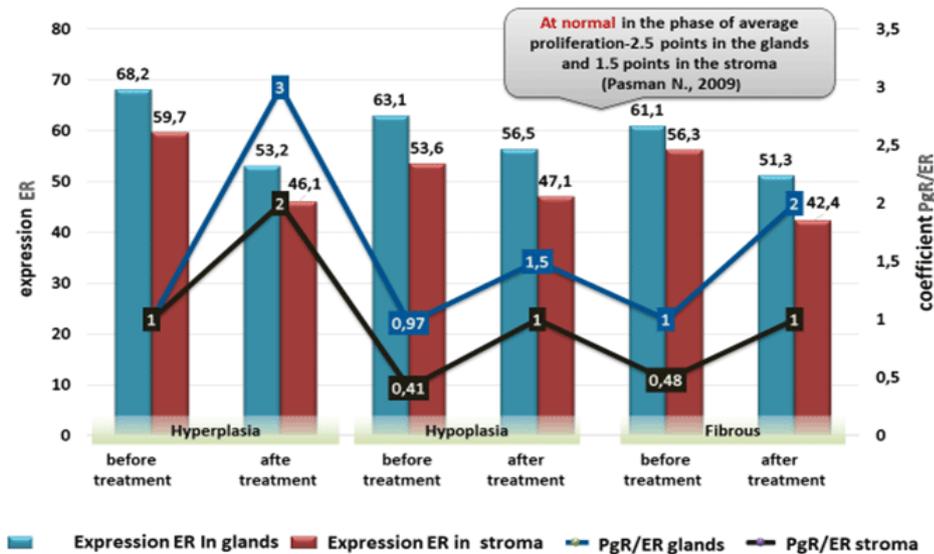


Figure 1: Changes In Endometrial Receptivity Parameters In The Dynamics Of Treatment

Thus, in women with fibrous form of CE, ER expression in glands and stroma decreased by 1.2 times by 1.3 times, which provided an increase in PgR/ER to 2.1 in epithelium and stroma ( $p < 0.05$ ). In the hyperplastic type of CE, ER expression decreased 1.3 times in both glands and stroma, which led to an increase in PgR/e to 3.2 in the epithelium and stroma ( $p < 0.05$ ). In the hypoplastic type of CE, ER expression in the glands and stroma decreased only by 1.1, and PgR/ER increased to 1.5 in the epithelium and stroma ( $p < 0.05$ ). This indicates a general normalization of immune processes occurring in the endometrium against the background of CE.

## Conclusion

The study revealed the features of local immune disorders in various morphological types of CE, damaging the receptors of the endometrium. "Adverse" morphotype CE according to IHCE is hypoplastic type, in which the developing hyperactivity and inhibition of cell-mediated reactions in the form of higher levels of CD56-positive lymphocytes and T-lymphocytes (CD3), weak expression of plasma cells (CD138), a reduced expression of the body in the epithelial and stromal components and reduce the ratio of PgR/ER in 2 times in comparison with the norm. The use of laser-magnetopuncture in the early rehabilitation of patients with CE contributes to the restoration of the immune profile of the endometrium. The best results were observed in hyperplastic and fibrous morphotype of CE, with an increase of 1.2 times factor (LIF), 1.4 times and NK-cells and CD56 on the background of a stable number of T-lymphocytes (CD3), reduction of plasma cells CD138 2.7 times. The PgR/ER ratio increased to an average of 2.5, which corresponds to normal

values. Consequently, the use of preformed factors influences on treatment and rehabilitation of patients with CE helps to regulate the ratio of steroid receptors in the endometrium, the relief of human tissue reception, which leads to normalization of the endometrium.

## References

1. Topil'skaya NI. Chronic endometritis is a subclinical inflammatory disease of small pelvis organs / NI. Tapil'skaya, SA. Karpeev IV Kuznetsova // *Gynecology*. - 2014;16(1):104-109.
2. Kozyreva EV, Davidyan LU, Komitova BB. Chronic endometritis in the aspect of infertility and non-breaching of pregnancy. *Ulyanovsk medico-biological journal*. 2017;2:56-62. Doi: 10.23648 / UMBJ.2017.26.6218
3. Cicinelli E, Matteo M, Tinelli R, Pinto V, Marinaccio M, Indraco Lo U and De Ziegler D, et al. Chronic endometritis due to common bacteria prevails in women with habitual miscarriage, which is confirmed to improve the outcome of pregnancy after antibiotic treatment. *Reproductive Sciences*. 2014;21(5):640-647. Doi: 10.1177/1933719113508817
4. Bouet PE, El-Hachem H, Monceau E, Garipey G, Kadoch IJ, Sylvestre C. Chronic endometritis in women with recurrent pregnancy loss and recurrent implantation failure: prevalence and role of office hysteroscopy and immunohistochemistry in diagnosis. *Fertil Steril*. 2016;105(1):106-110. Doi: 10.1016/j.fertnstert.2015.09.025
5. Kalinina N M. Chronic endometritis. Approaches to diagnosis and therapy. *Polyclinic "Medicum" Consilium*. 2015; 17 (6).