



CODEN [USA]: IAJ PBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.3556735>Available online at: <http://www.iajps.com>

Research Article

**EFFICIENCY OF SONOGRAPHIC RESEARCH IN
DIAGNOSTICS OF CHRONIC ENDOMETRITIS.**¹Kupina A.D., ²Petrov Y.A.

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¹ Doctor of Medicine, Professor, Department of Obstetrics and Gynecology № 2, Federal State Budgetary Educational Institution of Higher Education «Rostov State Medical University» of the Ministry of Healthcare of the Russian Federation, Rostov-on-Don, Russian Federation - mr.doktorpetrov@mail.ru²Clinical Resident of the Department of Obstetrics and Gynecology №2 Federal State Budgetary Educational Institution of Higher Education «Rostov State Medical University» of the Ministry of Healthcare of the Russian Federation, 344022, Rostov-on-Don, Russian Federation – anastasya1997@bk.ru**Abstract:**

Aim. *In the modern world, there is a tendency to increase the number of patients with chronic endometritis. Chronic endometritis may cause fertility decline and early reproductive loss. It is necessary to develop new diagnostic methods for this disease in order to select the optimal petrogenetically determined treatment tactics, to preserve and restore the reproductive health and fertility of patients.*

Materials and methods. *Evaluation of sonographic signs of chronic endometritis with the allocation of “masks” of the disease, as well as hysteroscopic macrotypes (hypo-, hyperplastic, mixed), which allow to specify the nature of endometrial lesions and determine an individual treatment strategy. The study involved 490 women who had a history of early reproductive loss (spontaneous abortion, undeveloped pregnancy, failed attempts at in vitro fertilization, and others). All women underwent the following studies: hysteroscopy, pathomorphological studies (aspirates and biopsy specimens from cervical of the canal channel and uterine cavity), sonographic, dopplerometric research.*

Results. *The frequency of verification of chronic endometritis according to histological research exceeded the frequency of confirmation of the disease in sonography, which necessitates a comprehensive examination of patients with early reproductive losses. The determination of macro types of chronic endometritis during hysteroscopy will simplify the differential diagnosis and reduce the incidence of sonographic “masks” of this disease.*

Keywords: *chronic endometritis, sonography, dopplerometry, macrotypes of chronic endometritis*

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Please cite this article in press Kupina Anastasia Dmitrievna *et al.*, *Efficiency Of Sonographic Research In Diagnostics Of Chronic Endometritis.*, *Indo Am. J. P. Sci.*, 2019; 06(11).

INTRODUCTION:

Chronic endometritis is one of the most common problems of modern gynecology, affecting the female population of different ages, which is a chronic inflammatory process that occurs with the defeat of the functional and basal layers of the endometrium [1]. According to various observations in Russia, up to 66% of women are affected by chronic endometritis. Moreover, most of them (about 88%) are of fertile age [2,3]. It was also found that CE can cause a decrease in fertility and early reproductive losses. So, in women with a verified diagnosis of "chronic endometritis" infertility is recorded in 60% of cases [4].

Thus, this problem is currently very urgent due to the increase in the number of patients, as well as the widespread occurrence of provoking factors, namely abortion, invasive procedures on the organs of the reproductive system (curettage, hysteroscopy, IVF), the use of intrauterine contraceptives, also an early debut or promiscuous history of sex and previous abortions [5,6,7,8]. Difficulties in the diagnosis of CE are associated with the latent asymptomatic course of the disease and the erased clinical picture, the ambiguity in the interpretation of the results obtained with ultrasonic, endoscopic and pathomorphological verification methods, which is of great importance in young patients with a history of early reproductive losses [9,10]. It is necessary to develop new methods for the diagnosis and treatment of CE that will allow preserving and restoring reproductive function in patients. The use of the sonographic method as a component of the CE verification algorithm will allow expanding modern diagnostic capabilities and initiating timely pathogenetic treatment based on a specific macro type identified during hysteroscopic examination [11,12].

The purpose of this study was to improve diagnostic methods for chronic endometritis based on the use of the sonographic method with the allocation of "masks" of the disease, as well as hysteroscopic macrotypes that allow to specify the nature of endometrial lesions and determine individual pathogenetically substantiated treatment tactics.

MATERIALS AND METHODS:

The study was conducted on the basis of the gynecology clinic FGBOU VO "Rostov State Medical University" and the gynecological department of the city hospital №8 in Rostov-on-Don. The study involved 490 women who had a history of early reproductive loss (spontaneous abortion, undeveloped pregnancy, failed attempts at in vitro fertilization, and others) and who were divided into two groups. Group I conducted a

retrospective analysis of 140 women who had a history of non-developing pregnancy, spontaneous miscarriage, artifact abortion, failed IVF; and a confirmed diagnosis of "chronic endometritis" based on the obtained aspirates and biopsy samples from the cervical canal and uterine cavity of the patients. In group II, a prospective analysis of 350 patients was carried out, in the history of which there were undeveloped pregnancies, spontaneous miscarriage, artifact abortion, failed IVF; and some of them were diagnosed with chronic endometritis according to morphological studies. Group II included women with early reproductive losses for up to 6 months after intrauterine intervention.

In the study, clinical and statistical analysis, hysteroscopic, ultrasound (sonographic and dopplerometric), pathomorphological (aspirates and biopsy samples from the cervical canal and uterine cavity) were used as methods of verification of CE. The analysis of the results and statistical processing was carried out using the programs Statistica v.6.0.

RESULTS AND DISCUSSION:

An ultrasonographic study performed by 490 women found that in 176 women (35.9%) with spontaneous miscarriage and abortion, in 206 women with unsuccessful IVF attempts (42.1%) and in 108 women (22%) with undeveloped pregnancy there were no signs of chronic endometritis. In 166 women (33.8%) with spontaneous miscarriages and / or abortions in the anamnesis, in 136 women (27.9%) with unsuccessful IVF attempts and in 188 women (38.3%) with an undeveloped pregnancy, a mismatch of the endometrial echostructure was revealed phase of the menstrual cycle.

The prevalence of hyperechoic areas in the median M-echo zone was observed 2 times more often if a woman had an artificial termination of pregnancy (in 49%) than in women with spontaneous miscarriage, as well as in 40% of cases in women with unsuccessful IVF attempts and an undeveloped pregnancy in history. In 25% of patients with spontaneous miscarriage, in 42.8% with undeveloped pregnancy, in 36.3% with abortions and IVF failures, hypoechogenicity of the uterine contour was recorded, which was often combined with varicose veins of the parametrium. 32.8% of patients with abortions, 33.3% of women with a history of abortion, 15.1% with spontaneous abortion and 24.8% with failures during IVF had hyperechoic changes in the basal layer of the endometrium. In the group of women with a non-developing pregnancy, the frequency of sonographic signs of CE was the highest and reached 46.5%.

According to a sonographic study, a change in the structure of the endometrium was identified as

signs of chronic endometritis, namely, hyperechoic areas of various sizes and shapes in the area of the median M-echo with individual areas of irregular shape and hypoechoicity: in 35.9% with mixed, 49% with hypoplastic and 42.8% of cases with a hyperplastic variant of CE. When comparing the results obtained by ultrasonography and hysteroscopic examination with the selection of macrotypes - mixed, hypo- and hyperplastic variants of CE, it was found that in more than half of the cases the endometrium did not meet normal echographic criteria. Localized areas of increased echogenicity (fibrosis, calcification) in the basal layer of the endometrium were detected in 27% with hyperplastic and in 22% of women with a mixed and hypoplastic version of CE. Most often, during a sonographic study, the combination of the hypoechoic contour of the uterine cavity with the expansion of the veins of the parametrium: in 80% of patients with hypoplastic, in 33% - with hyperplastic, in 45% - with a mixed variant of CE.

Ultrasound with dopplerometry made it possible to establish that in 51% of patients with hyperplastic, 53% with hypoplastic and 42.5% of patients with a mixed macrotype, the final diastolic velocity in the uterine arteries was reduced by 1.5-2 times and the resistance index was increased by 30 - 45% at the level of the basal arteries, and there is also an asymmetry of blood supply. Violations of the visualization of the spiral and basal arteries were found in 84% of patients with a mixed macro type, in 90% with a hypoplastic and 76% with a hyperplastic variant.

Heterogeneity of the M-echo with a predominance of areas of increased echogenicity was observed in every second patient with a hypoplastic variant (48%) and in every third woman with a mixed and hyperplastic variant (in 37 and 35%, respectively). Hypoechoic inclusions in the basal layer were detected more often with the hyperplastic variant - in ¼ patients (28%), with the mixed and hypoplastic variant - in 1/5 of the women (about 21% with these macro types). Hypoechoic uterine contour was recorded in ½ women with a hypoplastic variant (59%), 1.5 times less often - with a hypoplastic macrotype (43%), 3 times with mixed (15.1%). The mismatch between the endometrial echostructure and the phase of the menstrual cycle with the mixed variant was detected 2 times less often in comparison with the hypoplastic version and 1.5 times with the hyperplastic one. Varicose veins of parametria were observed in almost half of women with a mixed variant (47%), in a quarter - with hypoplastic type (25%) and a third (33.5%) - with a hyperplastic type. Visualization of the hypoechoic contour of the uterus (both in isolation and with the simultaneous presence of varicose veins of the

parametrium) was recorded in half of women with a hypoplastic variant - in almost every second (58 and 46.5%). With a mixed macro type, the combination of these characters was determined 4 times more often than with the registration of one character.

CONCLUSION:

1. An analysis of the data obtained by sonographic examination with hysteroscopic macrotypes showed that, in the mixed version, the morphological verification of CE against the background of placental tissue residues was two times higher than ultrasound imaging, isolated CE was slightly more sonographic (40% and 45%, respectively). Hypodiagnosis of chronic endometritis during sonography was due to the fact that the picture of the inflammatory process in the uterine mucosa was perceived as focal hyperplasia or endometrial polyp, and against the background of placental tissue residues - almost 2 times more often. In almost every eighth, with a mixed hysteroscopic macrotype (13%), CE was detected during morphological studies.
2. Sonographic diagnosis of CE against the background of placental tissue residues was twice less likely to verify chronic inflammation of the mucous membrane than a morphological study.
3. Sonographically identified polyps (focal hyperplasia) of the endometrium were found to be morphologically confirmed almost twice less often (18 and 6%, respectively), since about half of the CE episodes against the background of placental tissue residues were not diagnosed. Every seventh chemotherapy was not diagnosed (14%).
4. Hypodiagnosis of CE according to sonography was observed in almost a quarter of women with a hypoplastic macrotype (26%). The diagnosed sonographic picture of a successful endometrium had morphological confirmation 8 times less often (24 and 3%).
5. Thus, the frequency of histological verification of CE was superior to sonographic, which necessitates a comprehensive examination of patients with early reproductive losses. The determination of CE macrotypes during hysteroscopy will simplify the differential diagnosis and reduce the incidence of sonographic "masks" of this disease.

List of symbols and Abbreviations

CE - chronic endometritis

IVF - in vitro fertilization

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