CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.3675452

Available online at: http://www.iajps.com Research Article

FEATURES OF THE MITOTIC REGIME OF ENDOMETRIAL CELLS AGAINST THE BACKGROUND OF THE USE OF SILVER-CONTAINING INTRAUTERINE DEVICES

[1]Petrov Yu.A., [2]Kupina A.D.

FGBOU VO «Rostov State Medical University» of the Ministry of Health of the Russian Federation, 344022, Rostov-on-Don, Russia.

[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.ru

[2]Clinical 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

Article Received: December 2019 **Accepted:** January 2020 **Published:** February 2020

Abstract:

Aim. *The problem of birth control is one of the most pressing problems of modern society. That's why family planning and the creation of safe and reliable methods of contraception come to the fore. The aim of this work was to study the features of the mitotic regime of the endometrium when using silver-containing intrauterine contraceptive devices (IUDs), to assess the oncological risk in women who have been using this method of contraception for a long time (within 6 months - 7 years).*

Materials and methods*. Evaluation of the mitotic activity of endometrial and stromal cells in women who used silver-containing IUDs for different periods. The study involved 230 women who were divided into groups I (used IUDs for 6-12 months), II (for 1-3 years), III (for 3-5 years), IV (for 5-7 years) and the control group (51 women). Mitotic activity, the percentage ratio of the mitosis phases were determined in all groups.*

Results. *During the study it was revealed that the mitotic activity of the endometrium at different periods of use of silver-containing IUDs did not change significantly. However, in women who used silver-containing IUDs for a long time, there was the increase in the number of mitoses with a predominance of the pathology of the same species as in the control group, which indicates the need for using IUDs for no more than 5 years.*

Keywords: *silver-containing intrauterine contraceptive devices, mitotic activity, oncological risk, contraception.*

Corresponding author:

Kupina Anastasia Dmitrievna,
Clinical Resident,
Federal State Budgetary Educational Institution of Higher Education «Rostov State Medical University»
of the Ministry of Healthcare of the Russian Federation,
344022, Russian Federation, Rostov region, Rostov-on-Don,
29 Nakhichevan lane. Phone: 89518268150. E-mail: anastasya1997@bk.ru

QR code

Please cite this article in press Kupina Anastasia Dmitrievna et al., ***Features Of The Mitotic Regime Of Endometrial Cells Against The Background Of The Use Of Silver-Containing Intrauterine Devices.,*** *Indo Am. J. P. Sci, 2020; 07(02).*

INTRODUCTION:

The problem of birth control is one of the most pressing problems of modern society [1,2,3,4]. Current trends are such that women more often began to give birth at a later age. Also, couples in the modern world often have 1-2 children, which emphasize the need for effective and safe methods of contraception. In addition, according to WHO, ensuring the intervals between births is more than 2-2.5 years, reduces child mortality in childbirth by 4 times, and maternal mortality by 2 times. One of the most common methods of contraception in our country is considered to be intrauterine contraceptive devices (IUDs).

This method of contraception has proven to be a highly effective and reliable way to prevent an unplanned pregnancy [5,6,7]. However, it must be borne in mind that intrauterine contraceptives are a foreign body in relation to the body of a woman. One of the mechanisms of action of the IUD is structural and functional rearrangement of the endometrium, which prevents the fertilization of the egg. In studies of women using intrauterine devices, tissue infiltration with leukocytes, macrophages and lymphocytes was detected [8,9,10]. The absence of pathogenic microflora allowed us to regard this inflammatory reaction as a local response of the endometrium to the presence of a foreign body. Researchers also have found in the endometrium various pathological processes, including hyperplasia, in women using IUDs [11,12]. Thus, based on the above-described mechanisms of action of the IUD and literature data indicating the carcinogenic activity of plastics, metals and glass, a more detailed study of the oncological aspect of the use of this method of contraception is necessary [13].

Literature data on the effect of intrauterine devices on the mitotic regime of the endometrium are few [14], the period of their use in these observations is limited to 6-12 months, there are no studies on the mitotic regime when using silver-containing IUDs.

The purpose of this study was to study the features of the mitotic regime of the endometrium when using silver-containing IUDs, to assess the oncological risk in women who have been using this method of contraception for a long time (within 6 months - 7 years).

MATERIALS AND METHODS:

The study involved 230 women who were divided into groups I, II, III, IV and the control group. Group I included 26 women of reproductive age using IUDs for 6-12 months. Of these, the proliferation phase was recorded in 12 women, the secretion phase in 14 women at the time of the study. Group II included 50 women who used IUDs for 1-3 years; the proliferation phase was observed in 27 women, the secretion phase in 23 women. Group III included 56 women using this method of contraception from 3 to 5 years; the proliferation phase was observed in 26 women, the secretion phase in 30 women. Group IV included 47 women who had been using this method of contraception for a long time (from 5 to 7 years); the proliferation phase was observed in 25 women, the secretion phase in 22 women. The control group consisted of 51 women whose endometrium was obtained before the installation of IUDs (pipelle biopsy); the proliferation phase was observed in 23 women, the secretion phase in 28 women.

Endometrial scrapings were taken on the 8-10th or 19-23rd day of the menstrual cycle when using the IUD or immediately after their removal. By the time of the examination, all women were practically healthy, the average age was 28 years. For the study, women were selected whose endometrium was without pathological changes.

The endometrium was fixed in a 10% solution of neutral formaline, sections 6–9 μm thick were stained with Heidenhain's iron hematoxylin. Mitotic activity (the number of mitotically dividing into 100 fields of view of the microscope; objective 90x, ocular lens 10x), the percentage ratio of the mitosis phases were determined. The total number of pathological mitoses and various forms of pathology of karyokinesis, expressed as a percentage of the total number of mitoses. The data obtained were compared with the control, processed statistically using the Fisher LSD.

RESULTS AND DISCUSSION:

The results of the study showed that in the control group, on the 8-10th day of the menstrual cycle, the mitotic activity of the epithelium was 2 times higher than the mitotic activity of stromal cells (49,5±2,0 vs. 23,4±2,3). Among normal mitoses, prophases and metaphases prevailed (in the epithelial cells, respectively, 41,8% and 31,9%, in the stroma, 46,1% and 35,3%). The pathological nature of mitotic activity was observed much less frequently (1.75 + 0.25% in glandular epithelium, 1.8 + 0.3% in stromal cells). Separate forms of mitosis pathology were mainly represented by lagging chromosomes in metakinesis and when there was a separation, K-mitoses were often found. Data on the prevalence of these types of mitoses in the endometrium are given in the literature [16].

On the 19-23rd day of the menstrual cycle (middle stage of secretion) in the control group, the mitotic activity of the epithelium was 3 times higher than in stromal cells (15.8 + 0.35 and 5.1 + 0.6, respectively). Most normal mitoses were prophases

and metaphases. The number of pathological mitoses in this stage of the cycle tended to decrease (in the epithelium 0.6 + 0.015%, in the stroma 0.5 + 0.045%), their spectrum was identical to the proliferative phase.

In women from group I, the middle stage of proliferation in the epithelium and stroma showed a decrease in mitotic activity (37.2 ± 3.4 and 12.8 ± 1.5, respectively) (P <0.05) and the total number of pathological mitoses compared with the control group (P> 0.05). In the middle stage of secretion, the mitotic activity of epithelial cells was 15,2 ± 0,4% (P> 0.05) and was 4,4 times higher than in stromal cells (3,5 ± 0,4%). In both components, prophases prevailed. The number of pathological mitoses in the epithelium was 0,4 + 0,02%, in the stroma – 0,068 + 0,3% (P> 0.05), mainly they were represented by chromosome lagging in metakinesis and K-mitoses.

In women using IUDs for 1-3 years (group II), on the 8-10th day of the cycle, the mitotic activity of epithelial cells increased slightly (53,3 + 1,5) (P> 0.05), the mitotic activity of stromal cells (23, 2 + 3,6) did not change in comparison with the control group. The number of pathological mitoses in stromal cells decreased, in the epithelium it increased slightly (2,2 + 0,15; P> 0.05). In both components of the endometrium, the ratio of the number of prophases and metaphases was greater than 1. In the middle stage of the secretion phase, mitotic activity was slightly reduced in the epithelium (14,7 + 0,35; P> 0.05). In epithelial cells, a tendency toward the increase in metaphases was noted(P> 0.05), in stromal cells the increase in the number of prophases was observed. The number and spectrum of pathological mitoses did not change in comparison with the control group.

In group III, on the 8-10th day of the menstrual cycle, the mitotic activity of epithelial cells was 2,3 times higher than the mitotic activity of stromal cells (49,0 + 2,5 and 20,9 + 1,3, respectively). These indicators were comparable with the control group. The percentage of pathological mitoses in the epithelium did not change, but in the stromal cells decreased. Both in the epithelium and in the stroma, prophases prevailed (41,2 and 42,4%, respectively). On the 19-23rd day of the menstrual cycle, the mitotic activity of the epithelium was 2,8 times higher than in stromal cells (16,2 + 1,5 and 5,8 + 0,15, respectively). Among the normal phases of mitosis, prophases prevailed. The number of pathological mitoses increased (P> 0.05), but the diversity of their forms was not detected.

In the middle stage of proliferation in women from group IV who had been using IUDs for a long time (5-7 years), the mitotic activity of stromal cells increased (24,1 + 2,3; p> 0.05), compared with the control group; in the cells of the endometrial glands, it remained at the same level (51,6 + 3,7). In both components, the ratio of the number of prophases and metaphases was approximately 1. The total number of pathological mitoses in the epithelium increased (2,5 + 0,3; p> 0.05), and remained in the control group in stromal cells. Pathological mitoses were represented by K-mitoses, chromosome lagging in metakinesis, sometimes other forms. On the 19-23rd day of the menstrual cycle, mitoses were observed in epithelial and stromal cells, mitotic epithelium was 16,2 + 0,5, stromal cells - 5,4 + 0,4. Among normal mitoses, both components of the endometrium increased the number of metaphases. In both epithelial cells and stromal cells, the number of pathological mitoses increased, which amounted to 0,68 + 0,15% (p> 0.05) in the epithelium and 0,89 + 0,03% in the stroma (p <0, 05). Most of them were K-mitoses, chromosome lagging in metakinesis and during separation.

CONCLUSION:

1. The study showed that the mitotic activity of the endometrium at different periods of use of silver-containing IUDs did not change significantly. Only women who used IUDs for up to 1 year showed a decrease in the mitotic activity of epithelial cells and endometrial stromal cells. But it was transient, and with further use of the IUD, normal mitotic activity was noted.
2. The decrease in mitotic activity in the endometrium when using IUDs for 6-12 months was detected. Other authors, who obtained similar results, explain this by a decrease in the utilization of steroid hormones in the cells of target organs [14].
3. A great deal of material has been accumulated [15], which suggests that endometrial malignancy is accompanied not only by the increase in the intensity of cell division, but also by the jump in the number of metaphases (up to 70%) and pathological mitoses (up to 30-40%). When analyzing the mitotic regime of the endometrium with the use of silver-containing IUDs, it was found that the ratio of the number of metaphases and prophases, the number of pathological mitoses and their spectrum did not significantly differ from the data in the control group. However, in women who used silver-containing IUDs for a long time, there was the increase in the number of mitoses with a predominance of the pathology of the same species as in the control group, which indicates the need for using IUDs for no more than 5 years.
4. The data obtained are similar to the results of our earlier studies of the mitotic regimen in patients with inert IUDs [17]. Therefore, the addition of silver to the IUD does not adversely affect the

mitotic regime of epithelial cells and endometrial stroma.

List of symbols and Abbreviations
IUDs - intrauterine contraceptive devices

REFERENCES:

1. Radzinsky VE. Birth control in the modern world. Status Praesens, 2013; 5: 5-9.
2. Dikke GB, Erofeeva LV. Contraception in modern Russia: use and awareness (population study).
   Obstetrics and Gynecology, 2016; 2: 108-113.
3. Podzolkova NM, Rogovskaya SI, Koloda YuA. Modern contraception: new features and safety criteria. Moscow: GOETAR-Media, 2013:128.
4. Petrov YuA, Dolzhenkova LM. Histochemical examination of glycogen in the endometrium of women using intrauterine contraceptives. Obstetrics and Gynecology,1985;9:57-58.
5. Petrov YuA, Rymashevsky NV, Kovaleva EA. The effect of intrauterine contraceptives on the mucous membrane of the cervical canal and cervix. Problems of maternity and child care, 1987;8:59.
6. Petrov YuA, Kovaleva EA. Features of colpocytograms of women using intrauterine contraception. Klinicheskaya Laboratornaya Diagnostika, 1986;1: 51-52.
7. Petrov YuA, Kovaleva EA. The valid duration of use plastic intrauterine contraceptives. Obstetrics and Gynecology, 1986; 7: 40-42.
8. Petrov YuA, Rymashevsky NV, Pavlova AP. Inflammatory diseases of the organiss of the pelvic pelvis in intrauterine contraception. Problems of maternity and child care.1990;11: 57-59.
9. Radzinsky VE, Kostin IN, Polina ML, Petrov YuA, Gasanova BM. Diagnostic significance of chronic endometritis macrotypes differentiation among women with reproductive losses. Gynecological Endocrinology, 2017; 33(1): 36-40.
10. Kupina AD, Petrov YuA. Efficiency of sonographic research in diagnostics of chronic endometritis. Indo American Journal of Pharmaceutical Science. 2019; 6 (11): 15210-15213.
11. Petrov YuA, Kovaleva EA. Proliferative mucosal changes of the corpus and cervix uteri in women using intrauterine contraceptives. Problems in oncology, 1986; 32: 49-52.
12. Petrov YuA, Rymashevsky NV, Kovaleva EA. Endometrial condition with intrauterine contraception. Problems of maternity and child care, 1988;3:59-62
13. Vasiliev Yu.I. A new understanding of carcinogenesis. Russian Journal of General Chemistry, 1993; 4;362-372.
14. Ezhova LS, Zheleznov BI, Antipova NB. The effect of intrauterine contraceptives on the mitotic regime of the endometrium. Obstetrics and Gynecology, 1999;3:39-40
15. Manuilova IA, Krutkovskaya NP. To the diagnosis of endometrial precancer. Obstetrics and Gynecology, 1999 ;10;3-6.
16. Kazantseva IA. The study of the mitotic regime in the morphological diagnosis of tumors. Archive of Pathology, 1990;2: 77-82.
17. Petrov YuA. Oncological risk assessment of intrauterine contraception based on cytological studies of the endometrium. Problems in oncology, 1985;12:53.