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ABSTRACT

of the dissertation for the degree of Doctor of Sciences

EARLY PREDICTION AND PREVENTION OF INFLAMMATORY COMPLICATIONS IN THE POSTPARTUM PERIOD

Specialty: 3215.01 – Obstetrics and gynecology

Field of science: Medicine

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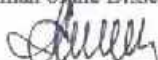
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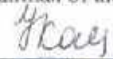
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GENERAL CHARACTERISTICS OF THE STUDY

The relevance of the subject. Maternal morbidity and mortality is not only a current health problem, but also a global socio-economic burden.[1] Purulent-septic diseases of pregnant women make up a significant part of this burden as the main cause of maternal mortality[2]. Postpartum inflammation in the postpartum period accounts for 5-7% of all obstetric pathology[3].

Premature rupture of membranes during labor, episiotomy, multiple vaginal examinations, and manual manipulations can cause endometritis.[4] Risk factors for menstrual inflammatory complications include diabetes, obesity, long-term steroid use, smoking, intra-amniotic infection, or bacterial vaginosis. existing infections[5]

The most common microorganism in infectious complications during this period is Staphylococcus aureus[6].

1. Moran PS, Wuytack F, Turner M, et al. Economic burden of maternal morbidity - A systematic review of cost-of-illness studies. *PLoS One*. 2020;15(1), з.1-18
2. Daifotis, H.A. Risk Factors for Postpartum Maternal Infection Following Spontaneous Vaginal Delivery Complicated by Chorioamnionitis / H.A. Daifotis, M.M. Smith, A.E. Denoble [et al.] // AJP Rep. 2020 Apr;10(2):e159-e164.
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4. Dalton E, Castillo E. Post partum infections: A review for the non-OBGYN. *Obstet Med*. 2014;7(3):98-102.
5. Жилинкова Н.Г., Соловьева А.В., Боташева К.Э. и др. Прогнозирование риска послеродовых инфекционных осложнений // Акушерство и гинекология: новости, мнения, обучение. 2020. Т. 8, № 3. Приложение. С. 36–44).

6. Creanga AA. Maternal Mortality in the United States: A Review of Contemporary Data and Their Limitations // Clin Obstet Gynecol. 2018 Jun;61(2):296-306.

However, infectious complications caused by gram-negative bacilli, enterococci, group B streptococci, and anaerobes are also common[7].

Perpartum sepsis is one of the five leading causes of maternal mortality worldwide, accounting for 10–15% of postpartum deaths8.

The risk of postpartum infection is also increased by advanced maternal age, high body mass index, diabetes, hypertension, immunodeficiency, bacterial vaginosis, positive group B streptococcus status, or sexually transmitted infections[9]. The most common infectious complication during puberty is endometritis[10].

Thus, the process of childbirth allows the growing vaginal bacterial flora to spread to the upper reproductive tract[11].

7. Dalton, E. Post partum infections: A review for the non-OBGYN / E. Dalton, E. Castillo // Obstet Med. 2014 Sep;7(3):98-102].
8. Boushra M, Rahman O. Postpartum Infection. 2023 Jul 10. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan–. PMID: 32809639.
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10. Faure, K. Postpartum endometritis: CNGOF and SPILF Pelvic Inflammatory Diseases Guidelines / Faure K, Dessein R, Vanderstichele S. [et al.] // Gynecol Obstet Fertil Senol. 2019 May;47(5):442-450.
11. Rouse C,E. Global Alignment of Immunization Safety in Pregnancy (GAIA) Postpartum Endometritis, Infection following Incomplete or Complete Abortion Work Group. Postpartum endometritis and infection following incomplete or complete abortion: Case definition & guidelines for data collection, analysis,

and presentation of maternal immunization safety data / Rouse CE, Eckert LO, Muñoz FM, et al. // Vaccine. 2019 Dec 10;37(52):7585-7595.

Other risk factors include chorioamnionitis[12], bacterial vaginosis, the use of internal fetal monitoring, repeated uterine examinations, and maternal colonization with group A or B streptococci, which predisposes to postpartum inflammatory diseases[13].

The development of highly effective and prognostic diagnostic methods that can determine the possibility of developing inflammatory complications in pregnant women with subinvolution of the uterus and their use in clinical practice is a rather urgent task.

Repeated scarring can lead to the development of endometriosis - an inflammatory complication of the menstrual cycle. Also, after natural childbirth, hematomas of the intermediate region, the unsuitability of perinioraphytes can lead to the development of endometritis[14]

Less often, necrotizing fasciitis of the surgical site may develop. An important risk factor for the development of necrotizing fasciitis in the postpartum period is diabetes mellitus[15].

Purulent-inflammatory diseases of the reproductive period pose a threat to reproductive health and can lead to infertility, miscarriages, ectopic pregnancy, and disability in women as a result of the loss of reproductive organs in the future[16].

12. Arora, P. Mean gestation at delivery and histological chorioamnionitis correlates with early-onset neonatal sepsis following expectant management in pPROM / Arora P, Bagga R, Kalra J. [et al.] // J Obstet Gynaecol. 2015 Apr;35(3):235-40),
13. Choi, Y. Updates on Group B Streptococcus Infection in the Field of Obstetrics and Gynecology / Y. Choi, H.S. Han, G.O. Chong [et al.] // Microorganisms. 2022 Dec 2;10(12):2398)
14. Eschenbach, DA. Treating spontaneous and induced septic abortions // Obstet Gynecol. 2015 May;125(5):1042-1048.
15. Kawakita, T. Surgical site infections after cesarean delivery: epidemiology, prevention and treatment / T. Kawakita, H.J. Landy // Matern Health Neonatol Perinatol. 2017 3:12, p.1-7

16. Barant, S. Abdominal necrotizing fasciitis after caesarean delivery / Barant S, Radbata D, Oberweis D. [et al.] // Rev Med Brux. 2016;37(3):178-182.

To identify these complications in modern clinical practice, such examination methods as cytomorphological examination of the contents of the uterine cavity, detection of endotoxins in the blood serum and lochia, determination of the interferon status of the ovaries, hysteroscopic examination of the postpartum uterus, and energy Doppler in ultrasound diagnostics are used.

Based on the above, it can be said that further search for highly effective and prognostic diagnostic methods that allow determining the possibility of developing infectious and inflammatory complications in pregnant women with subinvolution of the uterus, and their use in clinical practice are very relevant.

For this purpose, Raman spectroscopy can be used, which creates a comprehensive picture of the processes occurring in the postpartum period. This method was first proposed by Indian scientists Raman and Krishman[17].

Scientists have experimentally proven that the propagation of light waves gives different peaks in different molecules, and with the help of the obtained spectrograms, it is possible to determine the presence of pathological changes and the degree of severity, as well as infectious agents[18].

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17. Андрюков, Б.Г. Рамановская спектроскопия – современная диагностическая технология для изучения и индикации возбудителей инфекций (обзор) / Андрюков Б.Г., Карпенко А.А., Матосова Е.В. [и др.] //– Москва: Соврем. технол. мед.. 2019. №4, с.161-174).
18. Шатунова Е.П., Линева О.И., Тарасова А.В., Неганова О.Б. Послеродовые воспалительные заболевания матки: клинические и диагностические

грани проблемы. Российский вестник акушера гинеколога. 2021;21(1):79-83.

Combination fluorescence diagnostics is based on the use of the phenomenon of conversion of probed laser radiation into a back-reflected signal[19], which is used to characterize the fluorescent component, that is, to characterize tissue at the metabolic, morphometric, functional and structural levels. tissue, and the combination of the effect of combination light scattering and scattered light allows identifying the specifics of the processes occurring in tissues. This shows that there are significant differences in the intensity of the distribution of the peaks of the spectrum of combined light scattering in biological material obtained from patients[20]

Timely treatment and preventive measures in patients from a high-risk group for the development of inflammatory complications will significantly improve the immediate and long-term treatment results, the quality of life of women of reproductive age, and create positive conditions for their future generative development.

Object and subject of the study. The study was conducted based on the analysis of the results of examinations and clinical observations of pregnant women who underwent physiological and abdominal births at the Research Institute of Obstetrics and Gynecology of the Ministry of Health of the Republic of Azerbaijan in 2017-2019 and were included in the risk group due to the development of inflammatory complications. To solve the tasks set, 250 women aged 18 to 44 years who underwent physiological and abdominal births and 50 women whose menstrual cycle took place under physiological conditions were involved in the study.

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19. Zhang, J. Accuracy of Raman spectroscopy in differentiating brain tumor from normal brain tissue / J. Zhang, Y. Fan, M. He [et al.] // Oncotarget. 2017 May 30;8(22):36824-36831.

20. Dodo, K. Raman Spectroscopy for Chemical Biology Research / K. Dodo, K. Fujita, M. Sodeoka // Journal of the American Chemical Society, - 2022. 144 (43), - p. 19651-67.

The purpose of the research. Development of objective prediction criteria and optimization of complex preventive measures based on new diagnostic methods of inflammatory diseases of the postpartum period.

The duties of the research:

1. Determining the structure and frequency of inflammatory diseases in the postnatal period.

2. The study of various risk factors on the development of inflammatory complications of the postnatal period.

3. The evaluation of gynecological and extragenital pathologies as a risk factor for postpartum complications among examined women.

4. Studying the characteristics of changes in the individual microbiome of the uterus during the physiological course and inflammatory diseases of postnatal period.

5. Determining the diagnostic value of the Raman spectroscopy method for predicting and identifying inflammatory processes in postpartum women.

6. Determining the optimal diagnostic and prognostic criteria of inflammatory complications of postpartum period based on a comprehensive evaluation of the received data.

7. Developing a prognostic algorithm of inflammatory diseases of postpartum period based on optimal examination methods.

8. Application of diagnostic tactics of aggravated and non-aggravated forms of inflammatory diseases of postnatal period to practical health care.

9. The optimization of preventive measures for aggravated and non-aggravated forms of inflammatory diseases in postpartum women.

Research methods.

−The object of the study was 300 postpartum women during 2017-2019, 250 of whom had inflammatory complications during postpartum

period due to various reasons and 50 women went through postpartum period under physiological conditions. In the course of the scientific work, clinical and anamnestic, general routine laboratory-instrumental and obstetric examinations, bacteriological examination, immunological examinations (immune enzyme analysis), determination of the quality of life (SF-36 components), Raman spectroscopy, mathematical and statistical analysis methods were used.

The main provisions of the defense:

1. The assessment of etiopathogenetic mechanisms in inflammatory diseases of postpartum period is of great importance.

2. Despite the screening of inflammatory complications of puberty and the development of new effective diagnostic tools, it is noted that the prevalence of these pathologies is still high.

3. In addition to the CRZ, the number of leukocytes and the level of proinflammatory cytokines, which are considered the main markers of inflammatory processes, the indicators of Raman spectroscopy can be effectively used as the main predictors of inflammatory diseases in pregnant women. .

4. Some methods for predicting complications of the intellectual period.

5. New highly informative diagnostic methods (based on the registration of Raman scattering spectra and fluorescent light beams), which arose on the basis of fundamental achievements in the field of laser physics and spectroscopy, have found application in clinical medicine.

6. By means of Raman spectroscopy, in a very short period of time during the development of pathological processes, it is possible to conduct a highly accurate study of the body's substrates in the form of cells, tissues and biological fluids.

Scientific innovation:

- For the first time, new criteria for identifying patients who are at risk for the development of inflammatory diseases of the menstrual period have been developed.

- A complex of modern diagnostic methods of inflammatory diseases of the period of intelligence has been developed.

Based on the results of Raman spectroscopy, the informativeness of the examination of women included in the risk group for the development of inflammatory diseases of the menstrual period was evaluated.

Practical significance of the study:

☐ The conducted complex examination made it possible to determine the main causes of inflammatory diseases of the period of puberty and the clinical and laboratory characteristics of the course of the disease.

☐ New prognostic criteria of the disease have been developed based on the informativeness of modern diagnostic examinations for women who fall into the risk group for the development of postpartum inflammatory diseases.

☐ As a result of application of Raman spectroscopy in early diagnosis of inflammatory complications of the menstrual cycle and timely preventive measures, the frequency of aggravated forms of inflammatory diseases of the menstrual cycle has been reduced.

The application of research results. The results of the research work were applied to the daily work experience of the Scientific Research Institute of Obstetrics and Gynecology.

The name of the organization where the dissertation work was performed. The research work was carried out on the basis of the Scientific Research Institute of Obstetrics and Gynecology.

Approval of research work. The results of the scientific work were reported and discussed:

- Gynecological Endocrinology. The 17th World Congress (Firenze, Italy, March 2-5, 2016);

- Scientific and practical conference with international participation "Medical simulation - view of the future" (Vinnytsia, February 02, 2018)

-2nd World congress on maternal fetal neonatal medicine (March 31, 2019);

- Materials of the III international conference "Hemostasis, thrombosis and reproduction" (Saint Petersburg, May 13-15, 2019);

-4. International Congress of Pregnancy, Childbirth and Maternity (Bolu, February 20-23, 2020);

- "Global science and innovation - 2021: Central Asia" (Nur-Sultan, October 22-27, 2021);

- Webinar dedicated to the International Day of Doctors and Midwives (Baku, May 5, 2021),

-E-training on "Reproductive health and family planning" (May 3, 2021).

-ESGE 32nd Annual Congress (Brussels, 1-4 october, 2023)

- International III scientific-practical conference dedicated to the 90th anniversary of P. Kintrayan (Tbilisi, 2023)

-Endo Dubai Congress of the European Association of Gynecologists and Endoscopists (Dubai, February 25, 2024)

The results of the research work were discussed at the interdepartmental meeting of the Dissertation Council ED.2.06 of AMU on July 3, 2023, at the scientific seminar of the Dissertation Council of AMU on January 11, 2024 and at the scientific seminar of the Dissertation Council of AMU on October 17, 2024. On November 25, 2024, it was officially defended at the Dissertation Council ED 2.06, operating at the Azerbaijan Medical University.

Publications. 32 scientific works were published on the subject of the dissertation: 19 articles (foreign and native), 8 theses, 3 textbooks and 1 monograph.

The structure and volume of the dissertation. The dissertation consists of 135 computer-printed pages (193.000 symbols): introduction (11.005 symbols), literature review (64.339 symbols), materials and methods chapter (25.693 symbols), chapter III (63.123 symbols), chapter IV (45.394 symbols), chapter V (31.104 symbols), chapter VI (23.325 symbols), chapter VII (14.042 symbols), chapter VII (45.337 symbols), conclusion (5.310 symbols), practical recommendations (1597 symbols), literature list. The list of literature consists of 226 sources: 4 native and 222 foreign sources. 40 tables, 29 figures and 4 pictures are presented in the dissertation.

RESEARCH MATERIALS AND METHODS

At primary examinations, when patients were selected in accordance with the purpose of the study, great importance was attached to the change in their age in a wide interval. Thus, the age range of the examined patients was one of the predetermined selection criteria. Overall, the minimum age index of all women included in the study was 17, the maximum age index was 45, and the average age index was 29.02±6.904. In the first group, the minimum age was 17 years, the maximum age was 45 years, the average age was 29156±6904 years. In the second group, the minimum age was 17 years, the maximum age was 45 years, the average age was 28.94±7.302 years.

When analyzing the structure of the type of births of the women included in the study by group, it was established that abdominal births accounted for 76% in the main group and 18% in the control group. Cesarean section was planned in 40% of cases of the main group of patients, emergency - in 60% of cases. In the control group, childbirth ended naturally in 82% of cases and by caesarean section in 18% of cases. In the control group, planned surgical intervention was performed in 16% of cases, emergency - in 2% of cases. In the main group, the frequency of cesarean section was statistically significantly higher than in the control group.

Tədqiqata daxil edilmə meyarları:

-İltihabi ağırlaşmaların inkişafına görə risk qrupuna düşən hamilə qadınlar (fəsadlaşmış mamalıq anamnezi, fəsadlaşmış somatik anamnez, piylənmə, preeklampsiya, anemiya);

-Doğuşun gedişatında iltihabi ağırlaşmaların inkişafına görə risk qrupuna düşən zahı qadınlar (dölyanı mayenin vaxtından əvvəl axması, epiziotomiyalar, doğuşdan sonra təkrar manual manipulyasiyalar, cift qalıqlarının manual evakuasiyası)

-USM-də uşaqlığın subinvolyusiyası təsdiq edilmiş qadınlar;

-Doğuşdan sonrakı iltihabi ağırlaşmaların klinik əlamətləri olan zahı qadınlar (bədən temperauturunun artması, nəbzin dədiqəqə 90 vurğuya qədər artması, loxiumun patoloji xarakteri, aralıq tikişlərinin iltihablaşması, aralanması və ya qismən aralanması);

Qanın ümumi müayinəsində leykositoz, EÇS-in sürətlənməsi, leykositar formulun sola doğru dəyişməsi; tdqiqatımızın seçim

mərhələsində zahılıq dövründə meydana gələn iltihabi proseslər dedikdə müxtəlif səbəblərdən yaranan, qızdırma (t≥38ºC) ilə müşayiət edilən loxiometra və digər ağırlaşmalar nəzərdə tutulmuşdur. Araşdırmalar:

- iltihabi ağırlaşmalar baş verən və verməyən zahı qadınların yaş qrupu üzrə təhlilinin aparılması;

- pasiyentlər arasında yaş qrupları üzrə konstusional bədən tiplərinin rast gəlinilməsinin öyrənilməsi;

- tədqiqata cəlb etdiyimiz iltihabi ağırlaşmalar baş verən və verməyən zahı qadınların qan qrupları üzrə təhlilinin aparılması;

- doğuşun və iltihabi ağırlaşmaların hansı fəsildə baş verməsi üzrə təhlili.

Tədqiqatdan istisna edilmə meyarları

▪ Doğuşdan sonrakı dövrdə ekstragenital xəstəliklərlə (KRX, pielonefritin şiddətlənməsi) əlaqədar iltihablaşma olan zahı qadınlar;

▪ Laktostaz ilə əlaqədar olaraq bədən temperaturu artan qadınlar;
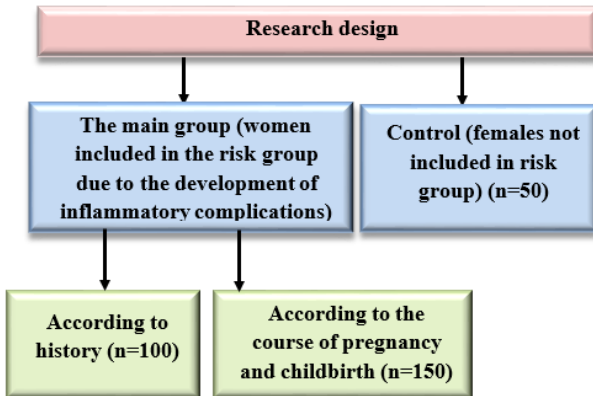
▪ İİV-infeksiyalı qadınlar.

Figure 1. Research design

The blood of practically healthy women and the patients with pathologies involved in the study was analyzed by biochemical methods. All biochemical analyzes were studied in blood serum. Blood samples taken for this purpose were collected in special

laboratory test bottles containing "Clot activator" (coagulation process accelerator). The serum samples obtained after rapid centrifugation of 2500 cycles/min for 10 minutes were studied. The concentration of albumin in the blood serum was analyzed by the colorimetric method using the reactive kit of the company "Human" (Germany). The principle of the method is based on the albumin forming a blue complex compound with bromcresol green. 1 ml of bromcresol green solution is poured into each of 2 test bottles (experiment and standard) and 10 μl of blood serum or standard albumin solution (50 g/l) is added to it and kept for 10 minutes. Then the optical density at a wavelength of 530 nm is determined.

The level of immunoglobulins in the blood serum of healthy individuals and patients involved in the study was determined by using the reactive kit of the company "Vector-Best" (Russian Federation). The principle of the method was the same as that of cytokines and the results were calculated based on the corresponding standard curves. Immunoenzyme tests were performed on the Stat Fax Plus (USA) immunoenzyme analyzer (λ=450 mm, differential filter 650 nm).

A microbiological study involved 100 people suffering from the infection and 50 people without other diseases in order to compare the frequency of occurrence of various bacteria in groups of patients who had and did not have infectious complications during the study period. A uterine smear was taken as biological material and placed in a Petri dish. The frequency of occurrence of opportunistic microorganisms was studied during the microbiological study. Both groups of women (sick and healthy) were examined for indicators of microorganism colonization in uterine smears taken from them upon admission to the hospital. The quality of life of women included in the study was studied along with clinical, anamnestic, laboratory and instrumental studies. Raman spectroscopy of blood samples from pregnant women was performed. The Kullback test was used to determine the informativeness of risk factors. The Kullback information test is calculated using the following formula:

J=10lgpPi-x0.5x(Pi-P2)

Here:

Informative value of the J risk factor,

Prevalence of the pi risk factor in the control group,

Prevalence of the P2 risk factor in the main group.

Venous blood samples taken from pregnant women with inflammatory complications of pregnancy and healthy pregnant women included in the study were sent to the Institute of Physics of the National Academy of Sciences of Azerbaijan, where they were examined using Raman spectroscopy. The Nanofinder 30 (Tokyo Instr.) device made in Japan was used for the study. The results obtained are based on a comparison of photons in spectrograms. This spectroscopy is based on an inelastic distribution of photons called the "Raman scattering distribution". Laser light directed at any system interacts with molecular vibrations, photons, and other motions in that system, causing the energy of the laser photons to shift up and down. Note that "photons" refers to the number of co-vibrations of atoms in any crystal lattice. At this time, the energy changes can provide information about the vibrational states of the system. Infrared spectroscopy usually provides information similar to monochromatic spectroscopy, but can also provide additional information. During Raman spectroscopy, any sample is illuminated by a laser beam. The electromagnetic radiation of the illuminated spot is collected by a lens and directed through a monochromator. Recently, work has been carried out on the application of Raman spectroscopy in various fields of medicine. Since biological materials of complex composition are often studied in medicine, the results of spectroscopy are also complex. Therefore, a computer must be added to the system to process the results. At this time, any biological sample is illuminated by beams emanating from a laser source, the beam entering a given biological system causes changes in the parameters of its various elements. Then, after the changes from the biological samples have passed, the outgoing radiation waves are transmitted to the wavelength selector, from there to the radiation converter, and finally, the data from the radiation converter is entered into the computer database, processed there by a special program and various results are obtained.

The obtained numerical data were processed by statistical methods taking into account modern requirements. The average values (M), their standard error (m), the minimum (min) and maximum (max) values of the series, as well as the frequency of occurrence of the quality indicators in the groups were determined for the group indicators.

Parametric method of Student's t-test, the mean difference between the selected indicators for pairwise related variants and the estimation of the difference between parts were used for the initial estimation of the difference between variation series.

Then non-parametric criteria - Wilcoxon (Mann-Whitney) U-criterion was used for the verification and clarification of the results obtained and Pearson's χ2 - criterion was used for frequency analysis. The correlation analysis was conducted in order to determine the strength of the relationship between the studied indicators.

It should be noted that the statistical processing of the results obtained during the research was carried out with the Statistica 7.0 application computer program.

All obtained results are reflected in tables and diagrams.

RESULTS OF THE RESEARCH AND THEIR DISCUSSION

Gynecological diseases that occurred during pregnancy or before pregnancy were analyzed by research groups. When analyzing the women who took part in the study by age groups and body types, it was found that $11.1\pm7.41\%$ of them fluctuated in the age range of 17-20 years, one of them had a normal Gynecological diseases that occurred during pregnancy or before pregnancy were analyzed by research groups. When analyzing the women who took part in the study by age groups and body types, it was found that $11.1\pm7.41\%$ of them fluctuated in the age range of 17-20 years, one of them had a normal Gynecological diseases that occurred during pregnancy or before pregnancy were analyzed by research groups. When analyzing the women who took part in the study by age groups and body types, it was found that $11.1\pm7.41\%$ of them fluctuated in the age range of 17-20 years, one of them had a normal build - 50.0 ± 35.36. % of the other and it was an asthenic type. The number of

women aged 21-30 years in the control group was 50.0±11.79%. 22.2±13.86% of these women had a normal build. 33.3±15.71% had an infantile build, that is, healthy women are included in the corresponding age range. The asthenic build type was determined in 11.1±10.48%, among them were healthy women whose age ranged from 21 to 30 years. The normosthenic type was recorded in 33.3±15.71% of women with healthy intelligence, falling within the appropriate age range, which includes suitable subjects for the study. At the time of the study, 38.9±11.49% of healthy women aged 31 to 40 years were present. Among women of this age, 42.9±18.70% were normosthenic, 14.3±13.23% were asthenic, and 28.6±17.07% were hypersthenic. During the study, there was not a single woman aged 41 to 45 years who had a healthy menopause.

The methods of contraception used in the study groups were analyzed, and it was found that 24.0±4.27% of the main group used long-term intrauterine contraception. However, in the control group with a healthy menstrual cycle, 6.0±3.36%-50 women used intrauterine contraceptives, which was reflected in the medical records and anamnestic data. This time, the statistical relationship between the groups was defined as p=0.006, that is, the difference was insignificant (p<0.05).

During the study, it was found that the patients of the main group who suffered from inflammatory complications regularly used chemical methods of contraception, and such individuals make up 6.0±2.37% of the total number of subjects in the group. During the anamnestic interview with us, it was found that among the healthy menstruating patients who make up the control group, chemical contraceptives are regularly used, and such individuals make up 6.0±3.36% of the control group. This time, the statistical difference between the groups was defined as p=1000, which was unfair.

As a result of the study, 29.0±4.54% of individuals with inflammatory complications, who made up the main group, used barrier contraceptives. However, it was found that 12.0±4.60% of women in the control group regularly used barrier contraceptives during sexual intercourse. This time, the statistical relationship between the groups was calculated as P=0.024, the difference was not significant.

During the study, when collecting anamnestic data, cases of regular use of combined oral contraceptives were recorded among patients in the main group who gave birth naturally and had a hospital-acquired inflammatory complication during pregnancy, which amounted to 7.0±2.55% of the number of patients in the main group.

10.0±4.24% of subjects in the control group, which consisted of healthy women who had physiological and abdominal births and had no inflammatory complications during pregnancy, regularly used combined oral contraceptives. This time, the statistical relationship between the groups was determined as P=0.535, which was not significant.

Types of abortions and number of births in history were studied by research groups.

As a result of our study on the forms of abortions in women with anamnesis, the current number of births, it was established that 37.0±4.83% of the main group had a medical abortion as a result of retrospective processing of anamnestic research data. and medical documents. As a result of similar surveys and studies, it was established that a medical abortion was performed in 14.0±4.91% of the study objects of the control group, whom we involved in the study to substantiate, compare and analyze the results. This time, the statistical relationship between the groups was calculated as P=0.004, the difference between the groups was statistically significant. When studying the anamnesis and medical documents, it was established that cases of spontaneous termination of pregnancy occurred in the group of patients with inflammatory complications in the postpartum period, and these individuals made up 30.0±4.58% of the total number of subjects in the main group. When analyzing the anamnestic data and medical documentation, no spontaneous abortions were found in patients in the control group who had no complications during pregnancy. At the same time, the statistical relationship between the study groups was determined at the level of P = 0.015.

After registering cases of abortions with a retrospective analysis of anamnestic data and medical documents, the studies were continued in the direction of determining the number of births in the corresponding

groups. At that time, it was known that among the patients who had inflammatory complications after childbirth, who made up the main group, they were able to give birth to a child for the first time, and such persons made up $60.0 \pm 4.90\%$ of the group.

For the purpose of comparison, analysis and substantiation of the results in the control group, $38,0\pm6,86\%$ of births without inflammatory complications during the period of involvement in the process were first-borns. This time, the statistical relationship between the groups was determined as p=0,014, which was statistically insignificant.

The study showed that the subjects in the control group had a second successful pregnancy, accounting for $32.0\pm6.60\%$ of the study group. However, $40,0\pm4,90\%$ of the patients in the main group who developed an inflammatory complication after childbirth had a successful second pregnancy. This time, the statistical relationship between the study groups was calculated as P=0,374.

In the group of pregnant women who developed inflammatory complications after childbirth, which constituted the main group, it was recorded that the births we performed were for the third and subsequent births, and such individuals accounted for $36,0\pm4,80\%$ of the patients in the group. At this time, it was established that there was no third pregnancy in the control group. The statistical relationship between the results obtained by the groups for this parameter was calculated as P=0.584.

For the period 2017-2019. as a result of the study conducted to analyze the timing of delivery of women with and without inflammatory complications, the age of patients with and without complications during the period of inflammation for the period 2017-2019. After analyzing the types of constitution and blood group by groups, retrospective analyses were also carried out by the season of the year when the birth occurred.

During 2017-2019, an analysis of the blood groups of pregnant women with and without inflammatory complications was carried out. It was found that there is no significant correlation between blood groups and the occurrence of inflammatory complications of the menstrual cycle. The distribution of blood group indicators in women in both the main and control groups was approximately the same.

24.9% of all women were not registered at the women's clinic: 30.8% in the main group and 19.5% in the control group (p <0.05). Unplanned pregnancy was observed in 22% of the main group and 13.2% of the control group. When studying the structure of pregnancy pathologies in women at risk for developing inflammatory complications, it was found that 30% of the main group had history of complicated obstetrics, 4% of the control group had history of complicated obstetrics, 50% of the main group had history of complicated obstetrics, history of somatic complication obstetrics 2% of the control group had history of somatic complication. Obesity was observed in 10% of women included in the main group. In the control group, there were no cases of obesity and preeclampsia. In the main group, preeclampsia was 20%. In addition, anemia was registered in 40% of the main group and 30% of the control group.

Analyzing the quantitative indicators of clinical manifestations of inflammation in groups, it was found that pain in the lower abdomen was present in 20% of the main group and 2% of the control group (Graph 1).
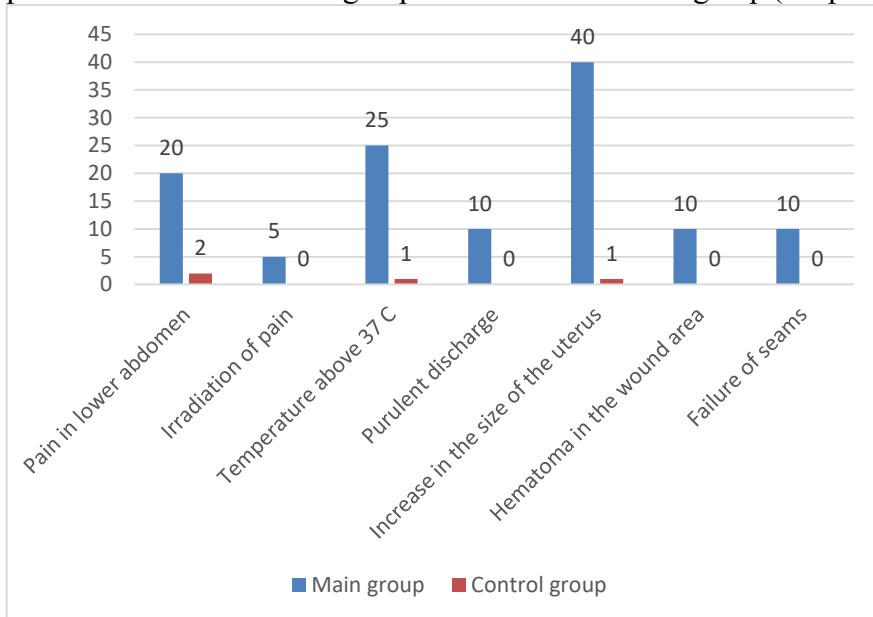
Graph 1. Indicators of clinical manifestations of inflammation by groups

In the main group, pain irradiation was observed in 5% of cases. There were no similar cases in the control group either. 25% of women with a body temperature higher than 37.5°C entered the main group, 1% of women entered the control group. Purulent secretions were present in 10% of patients in the main group. This was not the case in the control group. Uterine growth was observed in 40% of cases in the main group and in 1% in the control group. In the main group, a hematoma of the intermediate region was registered in 10% of cases, suture failure - in 10% of cases. However, these cases were not detected in the control group.

During the study, the structure of gynecological diseases in women of the main and control groups was studied. It is established that in the structure of gynecological diseases, the frequency of salpingophoritis and colpitis is significantly higher in women with inflammatory complications of the menstrual cycle compared to women in the control group. In the main group, 30% of women had salpingophoritis, and 21% had colpitis. This fact once again proves that inflammatory diseases of the genital tract cause complications of the menstrual cycle.

In the main group, blood loss of more than 10 ml per 1 kg of body weight during childbirth was registered in 170 (68%) of them, and in 125 (50%) of them, the period without water was more than 6 hours.

Only 0.8% of uncomplicated newborns placed in the intensive care unit were hospitalized in the first 6 days after birth.

For examination and treatment of persons at risk for the development of inflammatory diseases, we have developed and implemented optimized tactics of postpartum examination and treatment.

Bacteriological examinations were carried out on patients admitted with aggravated forms: cultures from the cervical canal, uterus, blood and urine. This study was conducted during the surgical treatment of purulent postoperative wounds on the front wall of the

abdomen, sutures of the intermediate area after episiotomy and other manipulations. Microbial associations of aerobic and anaerobic infections and monoinfections were found in most cases during the bacteriological examination of cultures from the cervical canal and uterus. Microbiological examinations of uterine smears were performed in research groups (Table 1).

Table 1

Results of microbiological analysis of uterine smears obtained from patients in study groups

| Mikroflora cinsi və növlər	Main group (n=100)		Control group (n=50)		P
	Say	%	Say	%	
Escherichia coli	22	22,0±4,14	10	20,0±5,66	0,835
Enterobacter spp.	7	7,0±2,55	4	8,0±3,84	0,925
Proteus spp.	8	8,0±2,71	4	8,0±3,84	1,000
Klebsiella spp.	31	31,0±4,62	3	6,0±3,36	0,001*
Enterococcus spp.	20	20,0±4,00	3	6,0±3,36	0,029*
Staphylococcus epidermicus	59	59,0±4,92	20	40,0±6,93	0,037*
Staphylococcus aureus	18	18,0±3,84	3	6,0±3,36	0,049*
Streptococcus spp.	4	4,0±1,96	5	10,0±4,24	0,161
Corynebacterium spp.	4	4,0±1,96	5	10,0±4,24	0,161
Acinetobacter spp.	12	12,0±3,25	2	4,0±2,77	0,143
Bacteroides spp.	29	29,0±4,54	6	12,0±4,60	0,024*
Peptococcus spp.	27	27,0±4,44	6	12,0±4,60	0,039
Peptostreptococcus spp.	39	39,0±4,88	2	4,0±2,77	0,001*
Clostridium spp.	8	8,0±2,71	6	12,0±4,60	0,527
Propionibacterium spp.	9	9,0±2,86	2	4,0±2,77	0,338

Proteus species were detected in 8 women of the main group. These samples constituted 8.0±2.71% of the total number of biological samples taken from patients of the main group. The genus Proteus was detected in 4 materials of the control group (8.0±3.84%). The difference between the groups was statistically significant (p=1.000). Klebsiella species were detected in 31 women of the main group

(31.0±4.62%), in 3 women of the control group (6.0±3.36%). The statistical relationship between the groups was p=0.001.

S. aureus was detected in 3 patients (6.0±3.36%) in the control group, and in the main group it prevailed in 18 patients (18.0±3.84%). The statistical relationship between the groups for this parameter was determined as P=0.049.

Streptococcus species were registered in 4 materials of the main group (4.0±1.96%), in 5 materials (10.0±4.24%) of the control group (p=0.161). The genus Acinetobacter was detected in 12 women of the main group (12.0±3.25%), in 2 women of the control group (4.0±2.77%) (p=0.143). Bacteriodes species were detected in 29 samples of the main group (29.0±4.54), in the control group in 6 women (12.0±4.60) (p=0.024). Peptococcus species were detected in 6 biological materials of the control group (12.0±4.60%), in 27 materials of the control group (27.0±4.44%) (P=0.039). According to the results of the microbiological study, it is known that the number and average rate of women infected with all pathogens in the main group was relatively higher than in the control group.

The study examined extragenital pathologies in pregnant women. As a result of the study, 4% of the control group and 20% of the main group developed otolaryngological inflammatory diseases after the birth process (Graph 2).
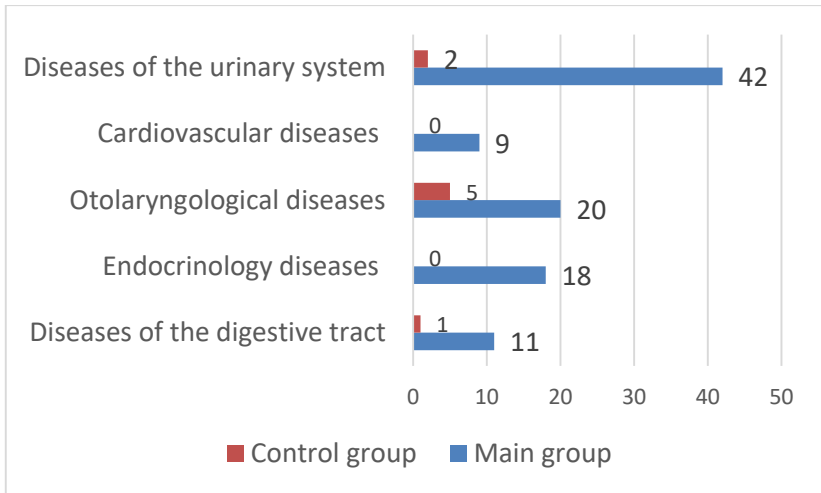
Graph 2. Structure of extragenital diseases before and during pregnancy

This allowed us to achieve similar results in the study of extragenital diseases. As a result of the study, in the structure of somatic diseases in the main group, otolaryngological diseases accounted for 20%, and diseases of the urinary system - 42%. In particular, it is known that patients with chronic pyelonephritis predominate. In women with diseases of the otolaryngology and urinary system, complications of the menstrual period against the background of the inflammatory process occurred with a reliably high frequency. This shows that treatment of these diseases before pregnancy and in the antenatal period is necessary.

Results of ultrasound examination in study groups and their assessment using the Kullbach method. As a result of the studies conducted to study the sizes and features of the relief of various sections of the reproductive system by ultrasound examination of the uterus in patients of the main groups and assessing their informativeness using the Kullbach method, for the main group consisting of women with inflammatory complications during menstruation, 38.0±4.85% - also, during ultrasound, it was

observed that the myometrium or muscular layer of the uterus is heterogeneous during pregnancy (postpartum ultrasound). In 6.0±3.36% of pregnant women in the control group, who did not have inflammatory complications after childbirth, myometrium heterogeneity was detected during postpartum ultrasound. Taking into account the indicators obtained by groups, the informativeness of the myometrium heterogeneity parameter using the Kullbach formula was calculated as 128.3. During the ultrasound examination after childbirth in patients with a healthy menstrual cycle and abdominal childbirth, a strong thickening of the endometrium by 2.0±1.98% was observed within the accepted norm. Thickening of the endometrium was observed in 98.0±1.40% of ultrasound examinations performed in the postpartum period in patients of the main group with complications of inflammation in the postpartum period. At present, when studying the indicators obtained by groups, according to the Kullback informativeness formula, we observe that the informativeness of the endometrial thickening parameter is 811.3 (Table 2).

During USM examinations performed during pregnancy, 97.0±1.71% of the patients of the main group, who showed physiological and inflammatory complications after abdominal childbirth, were found to have excessively enlarged uterus. 3.0±1.97% of healthy patients included in the control group were observed to have a uterus size higher than normal during USM. and this person covered the objects in the relevant research group. At this time, based on the indicators we obtained for the relevant research groups, the informativeness of this parameter was determined to be 800.7 using the Kulbak formula. In the main group of patients who were accompanied by inflammatory complications in the postpartum period after the birth process, the case of uneven expansion of the uterine cavity was recorded in 93.0±2.55% of women during USM performed during the postpartum period. In the control group, consisting of physiological and abdominal delivery patients, 2.0±1.98% had uneven expansion of the uterine cavity during analogous radiological examination. Using the indicators

obtained by the groups, the Kulbak index, the informatic indicator of the relevant parameter (the case of uneven expansion of the child's space) was determined at 758.7.

In the control group of women without complications during pregnancy, 2.0±1.98% of ovarian enlargement was recorded during USM. Despite this, during the USM examinations we performed in the main group of women with inflammatory complications during pregnancy, 10.0±3.00% of ovarian enlargement was recorded, and these individuals represent the general research subjects in the main group. At this time, when entering the indicators of occurrence of the corresponding pathological condition in the Kulbak formula, its informativeness indicator was determined to be 28.0.

<div align="right">Table 2</div>

The sizes and features of the relief of various parts of the reproductive system in patients and their informativeness.

US propeties	Main group	Condrol group	Kulbak-indeksi
Myometrium heterogeneity	38,0±4,85	6,0±3,36 *	128,3 (4)
Thickening of the endometrium	98,0±1,40	2,0±1,98 *	811,3 (1)
Growth in the size of the uterus	97,0±1,71	2,0±1,98 *	800,7 (2)
Uneven expansion of the uterine cavity	93,0±2,55	2,0±1,98 *	758,7 (3)
Increase in the size of the ovaries	10,0±3,00	2,0±1,98	28,0 (5)

When studying the sizes and features of the relief of various sections of the reproductive system using the ultrasound examination

of the uterus in research groups and assessing their informativeness using the Kullback method, when analyzing the ordinal state of the indicator obtained using the Kullback formula, The analyzed endometrial thickening index during ultrasound examination during pregnancy can be considered the most informative radiographic sign of inflammatory processes, J = 811.3.

From this point of view, endometrial thickening is characterized by an increase in the size of the uterus with an index of J = 800.7, uneven expansion of the uterine cavity with an index of J = 758.7, and heterogeneity of the myometrium with an index of The parameters were followed by an increase in the size of the ovaries with an index of J = 128.3, as well as an increase in the size of the ovaries with an index of J = 28.0.

Average age of the study groups, time of menstruation, marital status and the nature of regular sexual activity during pregnancy. As a result of the study, conducted by studying the average age of sick and healthy menstruating women, the time of the onset of the menstrual cycle, the nature of regular sexual life and marital status, 100 people, who were conditionally called the "main group" at this stage of the study had the lowest rate among patients who suffered from inflammatory complications during menstruation. The average age of the group was 29.9 ± 0.64 years, with an age index of 17, and the oldest age index was 41 years. In other words, as a condition of this stage of the study, in pregnant women who underwent physiological and abdominal childbirth and did not have any inflammatory complications during pregnancy, in a group of 50 people who made up the "control group" the youngest was 17 years old, the oldest was 42 years old, the rate was 30.3 ± 0.86 years. This time, the statistical relationship between the groups was unreliable ($p = 0.679$). As a result of the study among subjects of the main group (n=100), whose menstrual cycle was accompanied by inflammatory complications, with anamnestic determination of the onset of the menstrual cycle, the earliest onset of the menstrual cycle was recorded. at the age of 11 and at the latest at the age of 16, and the average menstrual cycle for the group was recorded with a period of the onset of the disease of

13.5±0.12 years. In order to compare and analyze the results during the study, we included in the process 50 women who did not have any inflammatory complications during menstruation. Among the objects of the conditional "control group", the youngest, who began menstruating. 12 years old, the youngest 16 years old, the average for the group 13, was determined 4±0.16 years. This time, the statistical correlation between the groups was calculated as p=0.883, that is, the difference was reliable.

During the study, 81 pregnant women (n=100) who had inflammatory complications in the main group reported that they regularly continued sexual activity during pregnancy, and these people made up 81.0±3.92% of the total number of those examined.

Table 3

Anamnestic indicators in women with complications and healthy women

İndekes	Main group (n=250)	Control group (n=50)	P
Age,years	29,9±0,64 (18-41)	30,3±0,86 (18-42)	0,679
Menarche	13,5±0,12 (11-16)	13,4±0,16 (12-16)	0,883
The beginning of sexual life	81,0±3,92	60,0±6,93	0,009*

Note: *- p<0,05.

Despite this, in a group of 50 pregnant women who did not have any inflammatory complications during pregnancy, only 30 people told us that they regularly continued sexual activity during pregnancy, and such people were 60.0± in the entire group - 6.93%. The statistical relationship between the study groups for this indicator was P=0.009 (p<0.05).

The titers of different microorganism samples were studied in

the endometrium of the patients according to research groups.

In the main group, the titer of Staphylococcus genus was 103 and 40 units and included 40.0±4.90% of uterine smear samples in the corresponding study group. However, the control group was present in only 1 sample (2.0±1.98%), the difference between the groups was statistically significant (p=0.001).

Enterococcus species were detected in 31 biological materials (31.0±4.62%) in the main group and 1 (2.0±1.98%) in the control group. The difference between the groups was statistically significant (p=0.001).

No woman in the control group had an E. coli titer above 103. In the main group, it was recorded in 16 samples (16.0±3.67%). The difference between the groups was statistically significant (p=0.003, p<0.005).

In the main group, 103 titers of Streptococcus epidermidis were determined in 18 smears (18.0±3.84%). There was none in the control group.

Titers of 103 and higher of various types of Candida microfungi were determined in 3 smears (3.0±1.71%) in the main group and in 2 smears (2.0±1.98%) in the control group. The difference was statistically insignificant (p=0.720).

The titer of Ureaplasma urealiticum species above 104 was detected in 3 samples (6.0±3.36%) in the main group and in 73 (73.0±4.44%) materials in the main group. The difference between the groups was statistically significant (p=0.003, p<0.005).

The titer of Mycoplasma hominis species higher than 104 was detected in 38 (38.0±4.85%) smears in the main group and in 1 (2.0±1.98%) material in the control group. The difference between the groups was statistically significant (p=0.003, p<0.005).

Results of immunological examinations in research groups.

During the research carried out for the purpose of studying non-specific and specific cellular and humoral immune factors such as T-lymphocytes, IL-6 and various immunoglobulins, the amount of T-lymphocytes in the blood samples taken from postpartum women with inflammatory complications, which formed the main group, was found to

be 0.55×10^9/l in minimal case, 1.24×10^9/l in the maximum case. Thus, the average indicator for the group was determined as $0.85 \pm 0.02 \times 109$/l.

During the examination of the blood samples taken from the objects of the control group of postpartum women who did not have inflammatory complications after childbirth, the average quantity of the appropriate cell population was calculated as $1.45 \pm 0.06 \times 10^9$/l. The corresponding indicator of the sample with the maximum T-lymphocyte amount was 2.08×10^9/l, and that of the sample with the minimum T-lymphocyte amount was 0.80×10^9/l in the relevant reasearch group. The statistical relationship between the indicators we obtained for the relevant parameter was P=0.001.

The average amount of IL-6 was 10362.1 ± 626.0 ng/g in the blood samples (n=50) taken from the control group consisting of postpartum women without inflammatory complications who were involved in the process of the comparison, analysis and justification of quantitative indicators of interleukin-6, one of the indicators of humoral immunity in the blood samples analysed on the research groups. At this time, among the biological samples, the analogous indicator of the sample with the minimum amount of IL-6 was 2948 ng/g, and that of the sample with the maximum amount was 16633 ng/g.

The average amount of IL-6 in the blood samples obtained from the main group of patients aggravated by logiometry during postpartum period was determined to be 24263.5 ± 480.2 ng/l. Among the corresponding samples, its amount was 32216 ng/g in the blood with the maximum amount of IL-6, and its amount was 15640 ng/g in the blood with the minimum amount of IL-6. At this time, the statistical relationship between the main and control groups was defined as p=0,001.

During the research phase while determining the levels of IgA in the blood samples on the groups, the average level of the corresponding immunoglobulin in the blood samples we received from the patients with non-aggravated inflammatory complications in the control group was 0.09 ± 0.006 g/l. In the control group, the corresponding index of the patient with the minimum IgA level was 0,02 g/l, and that of the patient with the maximum level was 0,16 g/l. Nevertheless, the average level of IgA in the blood samples obtained from the main group of patients with

inflammatory complications in postpartum period was 0,14±0,005 g/l slightly higher than that of the control group. At this time, blood samples taken from the main group showed a corresponding indicator of 0,06 g/l in the case of the minimal IgA amount and 0,24 g/l in the case of the maximum amount. Thus, the statistical relationship of the average indicators obtained from groups was calculated as p=0,01.

In the research stage while determining the IgG levels in the analogous biological materials on patient groups, the minimum IgG level was determined 0,55 g/l and the maximum IgG level was 1,34 g/l in the postpartum women with non-aggravated inflammatory complications in the control group. So the average indicator for the group was 0,93±0,022 g/l. During the biochemical analysis of the blood samples we obtained from the group of postpartum patients who had given birth and did not suffer from inflammatory complications during postpartum period, the corresponding indicator of the sample with the minimum IgG level was 0,24 g/l, and the maximum was 0,55 g/l. In this case, the average IgG level of the control group was determined to be 0,41±0,011 g/l, the statistical relationship of the indicators obtained from the groups was p=0,01.

During the research phase while determining the amount of sIgA in the blood samples taken from the groups, the average amount of the immunoglobulin fraction was determined to be 0,15±0,006 g/l in the analogous biological materials of the patients who had inflammatory complications after the birth process in the main group. The minimum sIgA level for the main group was 0,06 g/l, and the maximum was 0,25 g/l. The average indicator of sIgA in the blood samples obtained from the patients in the control group was determined to be 0,45±0,012 g/l. The analogous average indicator of the blood sample with minimal sIgA was 0,45±0,012 g/l. Among the corresponding samples, the minimum sIgA level indicator was 0,30, and the maximum sIgA level was 0,62 g/l, the difference was statistically significant (p=0,001).

During the research phase, when the quantitative indicators of lysozyme enzyme were calculated in the blood samples taken from the main and control groups, the average amount of lysozyme in the biological materials obtained from the patients with postpartum period

accompanied by inflammatory complications in he main group, was calculated to be 0,62±0,023 g/l, while this indicator was found to be slightly higher, i.e. 2,11±0,050 g/l in the patients with non-aggravated postpartum inflammatory complications, in the control group.

It should be noted that in the blood samples we took from the main group, the corresponding indicator was 0,21 g/l in the case with the minimum amount of lysozyme and 0,99 g/l in the case with the maximum amount of lysozyme.

In this regard, in the blood samples obtained from the control group, its amount in the biological material with the maximum amount of lysozyme was 2.68 g/l, and in the biological material with the minimum amount of lysozyme its amount was found 1,46 g/l. Thus, the statistical relationship p=0,001 was calculated between the average limit indicators of lysozyme in the groups.

During the research phase where the percentage share of the subpopulations of lymphocytes with different receptors within the total number of lymphocytes was determined in blood samples, the average number of lymphocytes with the CD^{3+} receptor in the relevant biological materials (n=100) obtained from the patients with inflammatory complications during the postpartum period was 60,8±0,32% of the total lymphocytes. Among the blood samples, the percentage of lymphocytes belonging to the CD^{3+} subpopulation was determined to be 55,0% in the material with the minimum amount, and 66.9% in the material with the maximum amount. During the analysis of the blood samples obtained from the patients who did not experience inflammatory complications during postpartum period, the number of lymphocytes belonging to the relevant subpopulation was slightly higher 62,6±0,60% than the average limit of total lymphocytes. On the corresponding group, the appropriate index of the sample with the minimum CD^{3+} lymphocyte amount was 56,0%, and that of the sample with the maximum amunt was 70,1%. The statistical relationship of the obtained values for the groups was p=0,0035.

In the research phase where the percentage share of lymphocytes belonging to the CD^{4+} subpopulation within the total number of lymphocytes was determined, the average indicator of the percentage

ratio of the number of lymphocytes with the mentioned receptors to the total lymphocytes on the cell surface was identified 41,8±0,47% in the biological material taken fromthe control group consisting of the patients who did not have any inflammatory complications after birth.

In the blood samples we took from the patients in the main group consisting postpartum women with inflammatory complications, its percentage share was 26,5% in the material with the minimum CD^{4+} cell amount and 38,4% in the material with the maximum CD^{4+} cell amount was. The corresponding average indicator for the total samples was calculated as 31,9±0,34%. The statistical relationship between the averages obtained from the main and control groups was p=0,0001. During the study, as a result of determining the percentage share indicators of the lymphocyte subpopulation with CD^{8+} receptor within the total number of lymphocytes in the groups, the average limit of the mentioned lymphocyte subpopulation was identified 25,7±0,19% in the blood samples taken the from patients who did not have inflammatory complications during postpartum period in the control group. It was recorded that blood sample with minimum level contained 22,8% and blood sample with maximum level contained 27,7% lymphocytes with CD^{8+} receptor. Nevertheless, during the analysis of blood samples of the women in the main group after childbirth, the women with the highest matching receptor lymphocyte were 32,4%, the lowest one was 23,5%, so the average limit was calculated as 28,1±0,28%. The statistical relationship between the indicators of the percentage share of the number of cells with the average CD^{8+} receptor of the obtained biological materials was determined p=0,0001.

In the research stage, where we determined the percentage share of the number of lymphocytes with CD^{16+} receptors among the total lymphocytes, the average indicator of the percentage share of the number of lymphocytes with CD^{16+} receptors among the total lymphocytes in the biological materials in the main group was determined to be 14,6±0,23%.

Its percentage share in the sample with the minimum corresponding subpopulation number was 10.8%, and in the case of the maximum, it was 18,5%. In the blood samples taken from the women in the control group, the percentage share of the lymphocyte subpopulation with the

CD^{16+} receptor within the total lymphocyte number was determined as 16,7±0,18% on average for the group.

In the biological material with the minimum number of CD^{16+} lymphocyte subpopulation, its percentage share was 15.0%, and in the material with the maximum number, it was 19.3%. The statistical relationship between the number of CD^{16+} lymphocytes in both study groups was p=0,0001.

Quality of life assessment methods. In the course of the study, we conducted the SF-36 survey among women for the first time. The SF-36 criterion can usually demonstrate the status of health economics and quality of life after treatment. It was first proposed by the RAND Corporation. In this criterion, the surveyed persons are questioned according to the physical and psychological components of their quality of life.

Physical components include their physical (PF), sexual (RP) functional status, pain intensity (BP) and general health (GH).

Psychological components include activities in life (VT), social functional status (SF), sexual status (RE) and general mental health status (MH).

SF-36 quality of life criterion of the physical component PF during calculations on the state of physical functions was determined on average 63.3±0.80 in the main group and 82.3±0.86 in the control group. It was noted that the statistical relationship between the average indicators obtained by the groups is p=0.0001. According to the SF-36 health questionnaire, sexual function (RP) was defined as 34.3 ± 1.36 points in the main group and 67.5 ± 2.50 points in the control group. The difference between the groups during the sexual health survey was statistically significant (P=0.0001, p<0.05).

According to the SF-36 survey of patients, the "pain intensity" (BP) criterion was 81.9±0.71 points in the control group and 73.2±0.93 points in the main group. During the survey, the difference between the groups was statistically significant (p=0.0001, p<0.05).

According to the "General health condition" (GH) criterion, the indicators were calculated as 69.2±0.71 points in the main group and 78.2±1.14 points in the control group. During this stage of the research,

the statistical relationship between the average indicators of the appropriate criteria for groups was p=0.0001.

At the stage of determining indicators with the criterion of "social functionality" (SF), the average indicator was 72.4±0.93 points in the main group, 82.3±1.56 points in the control group (p=0.0001). "Sexual emotionality" (RE) was calculated from 71.3±2.86 in the control group to 64.7±3.03 in the main group. The differences were not statistically significant (p=0.1615, p<0.05).

When looking at the structure of inflammatory complications in the women of the main group, it was found that there are big differences in the percentage indicators of inflammatory diseases. Thus, sepsis, which is considered a dangerous inflammatory disease, was detected in 0.4% of our patients, and peritonitis in 0.8%. On the contrary, suninvolution of the uterus was at a high level of 40%. Since the aim of our research is early prediction, immediate prevention of inflammatory diseases of the period of intelligence was carried out immediately and severe complications were prevented in time.

The results of our survey on the Hospital Scale of Depression (HADs) were analyzed by research groups.

As a result of our survey on the Hospital Scale of Seizures and Depression (HADs), it was determined that 42% of the subjects did not have panic attacks due to the depression section of the corresponding scale in the main group (5.40±0.17 points). In the control group, 38% of the patients who did not experience inflammatory complications after natural childbirth had an anxiety attack of the appropriate scale (5.05±0.29 points).

43% (9.02±0.11 points) in the main group and 46% (8.70±0.13 points) in the control group had a subclinical form of anxiety state. The difference between the groups was not statistically significant (p=0.0679, p<0.05).

During the analogous scale survey conducted in the control group, 16% of patients (13.88±0.48 points) and 15% (12.60±0.31 points) in the main group were diagnosed with the clinical manifestation of anxiety. The statistical relationship between the average score indicators for groups was unfair (p=0.2129, p<0.05).

76% of patients in the main group (5.11±0.17 points) and 62% (4.68±0.31 points) in the control group were diagnosed with depression (within the normal range). the difference between the groups was statistically insignificant (p=0.2129, p<0.05). While clinical form of depression was determined in 4% of the main group, none of the women in the control group had it at all.

The results of our survey on the Hospital Scale of Depression (HADs) were analyzed by research groups.

The results of our survey on the Hospital Anxiety and Depression Scale (HADS) were analyzed across study groups. As a result of our survey on the Hospital Anxiety and Depression Scale (HADS), it was determined that 42% of the research subjects did not have panic attacks on the depression section of the corresponding scale in the main group (5,40±0,17 points). 38% of the control women had an anxiety attack of the appropriate scale (5,05±0,29 points).

During the analogous scale survey, 16% of patients (13,88±0,48 points) in the control group and 15% (12,60±0.31 points) in the main group had a clinical manifestation of anxiety. The statistical relationship between the average scores of the groups was insignificant (p=0,2129, p<0,05).

76% of patients in the main group (5,11±0,17 points) and 62% (4,68±0,31 points) in the control group were diagnosed with depression (within the normal range). The difference between the groups was statistically insignificant (p=0,2129, p<0,05). While clinical form of depression was determined in 4% of the main group and in none of the women of the control group at all.

The results of the questionnaire on the anxiety-anxiety (HAM-A) and depression (HAM-D) components of the Hamilton scale were analyzed.

As a result of our survey on the anxiety (HAM-A) component of the Hamilton scale, in the main group of patients with inflammatory complications in the postpartum period, the average indicator of the corresponding component was determined to be 21,6±0,51 points, while its minimum indicator among the patients was 10 points and the maximum indicator was 32 points. Nevertheless, as a result of the

analogous survey we conducted in the control group of patients without inflammatory complications after childbirth, the average indicator for the group was slightly lower than the main group, which was 15,3±0,79 points. In the control group, the maximum index of Hamilton scale anxiety (HAM-A) component was 27 points and the minimum index was 5 points. On the anxiety component of the Hamilton scale (HAM-A) the statistical indicators p<0,0001 and t=6,99 were determined among the indicators received from the groups.

As a result of our group survey on the anxiety component of the appropriate scale (HAM-A), we determined that 7,0±2,55% of postpartum women with inflammatory complications had a mild level of anxiety in the main group (n=100). Nevertheless, in the control group of postpartum women who did not show inflammatory complications after childbirth, patients in the state of mild anxiety covered 26,0±6,20% of the group.

As a result of the study, 37,0±4,83% of 100 postpartum women with inflammatory complications were recorded to be in a moderate state of anxiety during the survey of the anxiety component of the Hamilton scale (HAM-A), but in the control group consisting women with healthy postpartum period, this indicator was higher at 52,0±7,07%.

When analyzing the results of the survey on the HAM-A component of the scale during the study, it was recorded that 48,0±5,00% of the research subjects in the main group had symptomatic anxiety, while in the control group this indicator was only 8,0±3,84%. During the survey of on the anxiety (HAM-A) component of the Hamilton scale, although the control group consisting of patients without postpartum inflammatory complications did not have a full manifestation of anxiety, in the main group of patients with postpartum inflammatory complications, the full manifestation of anxiety is justified in 8,0±2,71%. Statistical relationship of the indicators we obtained on the parameters of "absence of anxiety", "mild anxiety", "moderate anxiety", "symptomatic anxiety" and "full manifestation of anxiety" in the patient groups of the anxiety component (HAM-A) of the scale were calculated as $\chi2=44,19$ and p<0.0001.

During the survey phase of the depression (HAM-D) component of the scale, the average indicator of the corresponding component for the

group was determined as 15,9±0,35 points in the main group of women who had postpartum period accompanied by inflammatory complications after childbirth. Among the subjects of the study, 9 points were recorded for the depression component of the mentioned scale and 22 points for the maximum. According to the results of a similar survey we conducted in patients with healthy postpartum period (n=50), their average score was slightly lower than the similar score of the main group, which was 12.6±0.55 points. Among the patients in the control group, the lowest score was 5 points, and the highest score was 20 points. Statistical indicators t=5.20 and p<0,0001 were identified between the mean values obtained during the survey phase of the Hamilton Rating Scale for Depression (HAM-D) component in patient groups.

According to the results of survey on the depression (HAM-D) component of the scale in the main group, there were no research subjects who did not have depression, but in the control group consisting of healthy postpartum women, this condition was recorded in 12,0±4,60% of the research subjects. As a result of the survey on the depression component of the appropriate scale (HAM-D), it was concluded that 24,0±4,27% of women with inflammatory complications in the main group had mild depression. Nevertheless, this indicator was high 46,0±7,05%, among patients in the control group who had a healthy postpartum period. Based on the results of the survey with the depression (HAM-D) component of Hamilton Rating Scale, during the stage of determining the research subjects in the state of moderate depression, in the main group of postpartum women with complications after childbirth, the indicator was identified as 45,0±4,97% of the total research subjects. Nevertheless, it was substantiated by the survey that 36,0±6,79% of postpartum women in the healthy control group suffered from mild depression, which is significantly lower than that of the main group. According to our conclusion based on the survey carried out in the research groups on the depression (HAM-D) component of the scale, 31,0±4,62% of patients in the main group with postpartum inflammatory complications had severe depression. It was recorded that only 6,0±3,36% of postpartum women who did not have inflammatory complications in the control group suffered from severe depression.

According to the results of our survey on the depression (HAMD) component of the appropriate scale, neither in the control group of postpartum women who did not have postnatal inflammation, nor in the main group that had postpartum inflammatory complications, there were no research subjects with very severe depression among the research subjects. It should be noted that the statistical relationship indicators on the parameters of "no depression", "mild depression", "moderate depression", "severe depression" and "very severe depression" were defined as $\chi 2=26,98$ and $p<0,0001$ in the patient groups according to the depression (HAM-D) component of Hamilton Rating Scale.

As a result of our survey on the Hospital Anxiety and Depression Scale (HADS) among patients in the main group of women with inflammatory complications of the postpartum period, it was determined that 43% of patients had a subclinical form of anxiety. during the period of our survey on the (BP) criterion, in the control group consisting of women who did not have any form of inflammatory complication after childbirth, the average indicator for the corresponding criterion was 81,9±0,71, while in the main group consisting of women with postpartum period accompanied by inflammatory complications after childbirth, this the indicator was determined slightly lower at 73,2±0,93. At the stage of the study where the indicators were determined by the "social functionality" (SF) criterion of the mental component of the SF-36 quality of life questionnaire by groups, while the corresponding indicators of the patients in the main group were calculated to be 72,4±0,93 on average, this indicator is slightly higher 82,3±1,56 in the patients of the control group consisting of th women who had a healthy postpartum period without any complications after childbirth. As a result of the study, based on the results of our survey on the anxiety (HAM-A) component of the Hamilton scale, although there were no subjects among the women in the main group, in the control group, no anxiety disorder was recorded in 14.0±4.91% patients who did not have inflammatory complications in postpartum period.

According to the Edinburgh Postnatal Depression Scale (EPDS), which was performed 6 weeks after the operation of the patients who had a planned Caesarean section, the average index for the group was

3,78±0,19 points, which was significantly lower than the first average we obtained for the corresponding group.

As a result of our study to determine the degree of manifestation of postpartum depression according to the Edinburgh Postnatal Depression Scale (EPDS) in the "planned" and "immediate" groups after the operation, in the group of 23 patients who underwent a planned operation it turned out to be an average of 6,96±0,28 points as a result of the survey we carried out according to the corresponding scale on the morning of the operation. The minimum indicator of the relevant scale was found to be 5 points and the maximum indicator was 10 points among the patients.

In the group of 33 people we had to perform caesarean section under urgent conditions, its average indicator was identified 6,58±0,16 points as a result of the survey we conducted according to the appropriate scale on the morning of the operation. The minimum indicator of the relevant scale was found to be 5 points and the maximum indicator was 9 points among the patients. The statistical relationship between the indicators of the degree of manifestation of postpartum depression according to the average Edinburgh Postnatal Depression Scale (EPDS) we obtained for the study groups where we performed planned and emergency surgery on the morning of the cesarean section was calculated as p=0,2204. According to the Edinburgh Postnatal Depression Scale (EPDS), which we performed 6 weeks after the operation of the group in which we performed a planned cesarean section, the average index for the group was 3.78±0.19 points, which means that it was significantly lower than the first average we obtained on the morning of the caesarean section for the corresponding group.

Characterization of Raman spectroscopy. The results of optical radiation of blood serum from the women included in the study were collected and spectral radiation was recorded. Laser irradiation and delivery of white light to the examination point was accomplished through a light transmitter with a disposable sterile protective cover. Using the capabilities of blood serum Raman spectroscopy, we determined its effectiveness by differentiating women with inflammatory complications during postpartum period. Optical spectral responses are

recorded when the light transmitter is moved towards the bioptate. Also, spectra were registered in the comparison group. The graphical and digital registrations were analyzed in a complex hardware program.

On average, in the range of 500-600-1800-2000 cm^{-1}, there are numerous lines that are individual for each component and organic compounds of blood. It is possible to determine the quantitative indicators of both the biological compounds themselves and the examined blood serum sample in the above-mentioned range in the spectrogram for the presence or absence of this inflammation. The highest frequency of 15810781 cm^{-1}, the lowest frequency of 1686621 cm^{-1}, the highest intensity of 59550003 mw /cm^2 and the lowest intensity index of 123 mw/cm^2 were recorded in the blood serum of the mentioned woman (Graph 7.1.1).
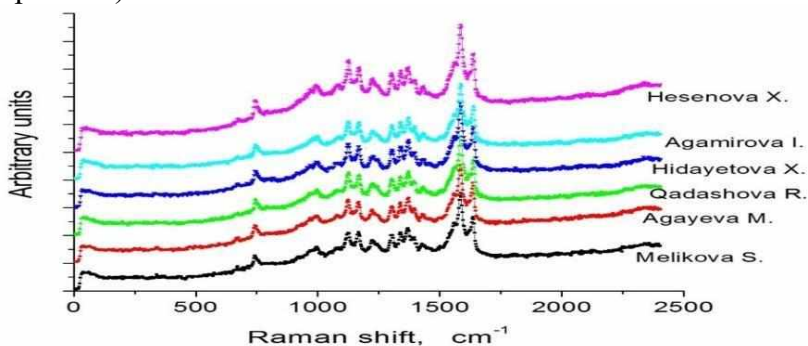

Figure 2. Raman characteristics of inflammatory diseases that develop during postpartum period

Thus, it is possible to make an opinion about the presence of inflammatory processes on the basis of different indicators of the amplitude of normal peaks during inflammatory diseases developed in postpartum period with different forms and degrees of complication. So, on the basis of the development of inflammation, additional peaks appear at certain wavelengths during the examination of blood serum in postpartum women, which provide information about the degree of severity of inflammatory processes, its chemical composition, and the quantitative composition of lipids, proteins and carbohydrates at a

certain concentration. Indicators such as Raman peak, wavelength amplitudes, widths and quantities are very informative. Based on them, the peaks, their shape, convexity and smoothness of the spectral curves are recorded.

Analyzing the data obtained during Raman spectroscopy of the blood serum of 300 postpartum women included in the study, it was found that there were differences between the frequency and intensity of the highest peaks. In the control group, that is, practically healthy women, these frequency and intensity indicators were lower. The results obtained in the main group were diffirent. We also organized relative groups of women with high, medium and low frequencies based on the obtained indicators. It was found that there were women with a higher frequency of peaks, medium and low frequency.

Table 4

Quantification of frequency and intensity of Raman spectrogram of postpartum women included in the study

Postpartum women	High frequency		Medium frequency		Low frequency	
	Number	%	Number	%	Number	%
Main group (n=250)	48	19,2	95	38	107	42,8
Control group (n=50)	-	-	-	-	50	100

The frequency and intensity limits of wave peaks on Raman spectroscopy were high in 48 (19.2%) women included in the study, in 95 (38%) women it was medium and in 107 (42.8%) women it was average. Lower frequency and intensity indicators were also found in the control group. However, the control group's limit was lower than the indicators of the women with low limit in the main group.
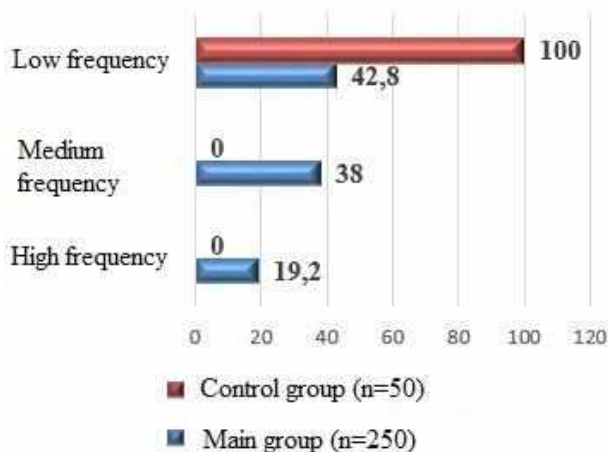
Graph 3. Comparative frequency and intensity indicators of Raman spectrogram of postpartum women included in the study

As can be seen from Graph 1, among the women involved in the study, the number of women with low frequency was 4.8% more than women with medium frequency and 23.6% more than women with high frequency. In the control group, a low frequency was recorded in all women. As can be seen, the number of women with higher frequency was less, it was 19.2% in total and 107 women had a lower frequency indicator of blood serum spectrogram. From the obtained results, it was found that the frequency and intensity indicators were low in 50 women included in the control group.

We also determined the average indicators of the frequency and intensity of the highest peaks in postpartum women included in the study. The obtained results are reflected in table 5.

Table 5

Mean frequency (M±SD) of Raman spectrogram in postpartum women included in the study groups

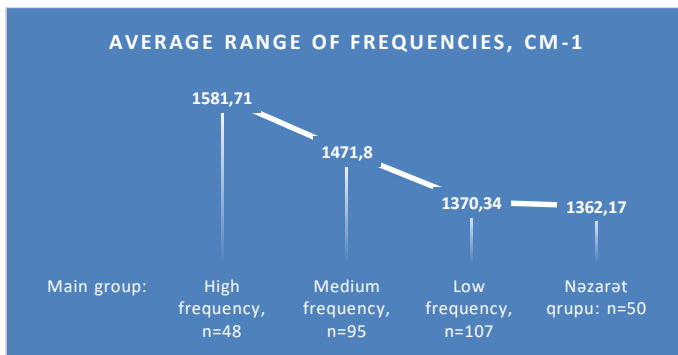| Postpartum women (n=300)	Mean frequency, cm^{-1}	P
Main group:		

48 postpartum women	1581.7124±2.404	p<0.001
95 postpartum women	1471.8071±23.36	p<0.001
107 postpartum women	1370.342±22.77	p<0.001
Control group: 50 postpartum women	1362.1774±37.280	p=0.27093

In the female group (n=48) with a higher spectrogram frequency $(1581,7124\pm2,404$ cm^{-1}), the intragroup differences were moderate statistically significant (p<0.001). The difference between the groups of women with moderate spectrogram frequency $(1471,8071\pm23,36$ cm^{-1}) and the women (n=95) with lower spectrogram frequency was statistically significant (p<0.001). The difference between women (n=107) with lower spectrogram frequency $(1370,342\pm22,77$ cm^{-1}) and control group indicators $(1362,1774\pm37,280$ cm^{-1}) (n=50) was statistically insignificant (p=0.27093, p<0.05).

As can be seen, there were no differences between the 107 women in the main group with a low spectrogram frequency and the women in the control group, which indicates that they did not have an inflammatory process.

As can be seen from Graph 4, the average frequency indicator in the group of high-frequency women was 109.91 cm^{-1} higher than the average indicator of medium frequency women and 211.37 cm^{-1} higher than the average indicator of low frequency women. In the control group, this index was 219,54 cm^{-1} less than the average index of women with high frequency wave peaks.

Thus, as can be seen from the graphs and pictures, there were general similarities in the spectrograms of the blood samples of postpartum women who showed inflammatory complications during postnatal period.

Graph 4. Distribution of average frequencies of Raman spectroscopy wave peaks in study groups

Mean frequency (M±SD) of Raman spectrogram in postpartum women included in the study groups (M±SD)

Postpartum women (n=300)	Average intensity limit, mw/cm2	P
Main group:		
48 postpartum women	8953.8543±9018.7595	p<0.001
95 postpartum women	6539.0854±776.550	p<0.001
107 postpartum women	6040.219±930.2501	p<0.001
Control group: 50 women	6066.4287±1029.0914	p=0.44828

Statistical calculations show that the difference between the group of women with high spectrogram intensity (n=48) and women with moderate intensity (n=95) was statistically significant (p<0.001) (Table 6). There were statistically significant differences between women (n=95) with moderate intensity and the women (n=107) low intensity. The difference between the women (n=107) low intensity and control group (n=50) was statistically insignificant (p=0,44828, p<0,05).
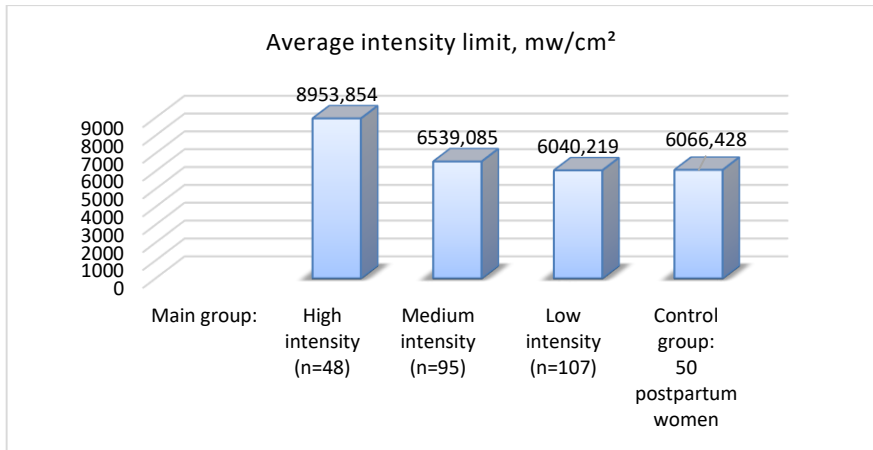
Graph 5. Distribution of average intensities of wave peaks on Raman spectroscopy in study groups

As can be seen from Graph 3, the indicator of high intensity of wave peaks according to Raman spectroscopy was 2014,774 mW/cm^2 more than the average intensity indicator and 2513,644 mW/cm^2 than the low intensity indicator.

Differences recorded in the intensity of the spectrum peaks of combined light emission indicate significant differences in the metabolic profile of women with inflammatory complications during postpartum period. From the conducted research, it is known that there has been a change in the metabolic profile depending on the presence or absence of inflammatory complications.

Comparative analysis of the results of blood Raman spectroscopy with the level of leukocytes and C-reactive protein in the blood in postpartum women. To determine the informativeness of Raman spectroscopy, we also comparatively analyzed the average values of C-reactive protein and leukocytes in women. As already mentioned, we divided the patients into conventional groups according to high (n=48), medium (n=95) and low (n=107) frequencies and intensities based on the average indicators obtained in the Raman spectroscopy of postpartum women. We calculated the statistical accuracy by determining the average

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indicators of C-reactive protein and leukocytes for those conditional groups.

CRP is one of the 30 acute-phase proteins. It manifests itself in response to the introduction of a foreign agent or during the development of an autoimmune reaction. The permeability of the vascular wall increases, its adhesive properties change, lymphocytes, macrophages and platelets are activated in response to an increase in the level of CRP in the blood. Thus, reflecting the degree of inflammation, CRP is one of the main acute phase proteins in the body and is rightfully considered the main marker of inflammation.

Studies have shown that CRP is not only an indicator of inflammation or infection, but also an important regulator of inflammatory processes. It can increase up to 1000 times in areas of inflammation and infection.

However, it should be taken into account that CRP reflects two sides of the inflammatory process, depending on the level in the blood. At very high concentrations (acute phase range > 10 mg/l), CRP is the indicative of an acute inflammatory process caused by infection. CRP in the highly sensitive range (usually <10 mg/l) reflects the activity of low-grade chronic inflammation associated with the development of atherosclerosis.

Taking these into account, we determined CRP which is considered an actual indicator of the inflammatory process in postpartum women.

In addition, it is known that the amount of leukocyte cells and their differentials (for example, neutrophils, lymphocytes, monocytes, eosinophils and basophils) are established markers of systemic inflammation.

Leukocyte accumulation plays an important role in protective and pathological immune responses in many diseases. The increase in the amount of leukocytes in the blood circulation involves several processes, such as rolling and sticking to the endothelial cells lining the inner walls of blood vessels, migrating through the inner walls of blood vessels to surrounding tissues, and migrating to other tissues.

Leukocytes participate in the regulation of systemic inflammatory response syndrome, fever, and leukopoiesis due to the formation of far-reaching cytokines.

Based on the results of Raman spectroscopy, we determined the average index of CRP and leukocytes in groups of patients, which we call high, medium and low frequency, as well as in the control group.
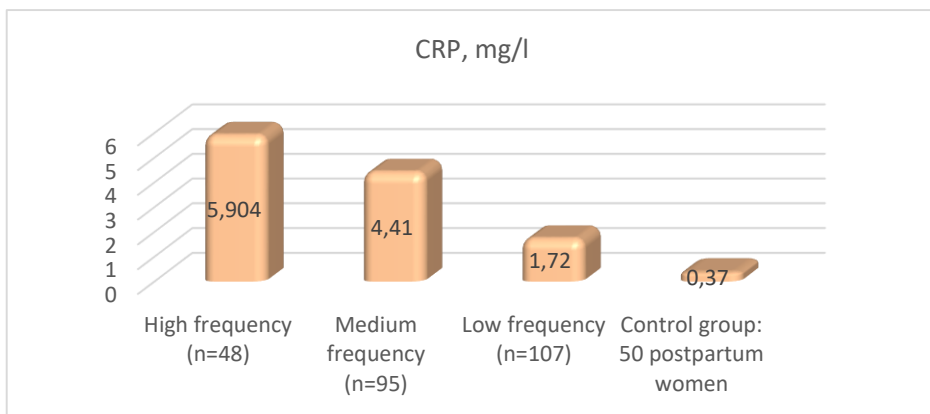
Mean CRP level and leukocyte amount in the women divided into conventional groups according to the results of Raman spectroscopy

Postpartum women (n=300)	CRP, mg/l	Leukocytes $x10^3$ /l
Main group:		
High intensity (n=48)	5,904±0,76	17,891±0,99
Medium intensity (n=95)	4,41±0,903	14,541±0,935
Low intensity (n=107)	1,72±0,66	11,344±0,87
Control group: 50 postpartum women	0,37±0,123	7,46±1,521

As can be seen from Table 5, the average limit of CRP indicator (5.904±0.76 mg/l) was also high in postpartum women with high frequency and intensity of wave peaks according to Raman spectroscopy. The mean limit of the CRP indicator was higher in the group of conventional women with a higher wave peak (n=48) than in the group of conventional women (n=95) with an average frequency and intensity of the wave peak (4,41±0,903 mg/l) (p<0,001). The mean limit of CRP indicator was also statistically high (p<0,001) in the group of conventional women with a more moderate wave peak (n=48) than in the group of conventional women with lower wave peak frequency and intensity (n=95). Although the average limit of CRP indicator (1,72±0,66 ml) was lower in the women with low frequency and intensity of wave peaks according to Raman spectroscopy, this indicator was statistically significantly higher than in the control group (0,37±0,123 mg/l) (p<0.001).

According to Raman spectroscopy, the average level of leukocytes in the blood (17,891±0.99 x103/l) in postpartum women with high frequency and intensity of wave peaks (n=48) was
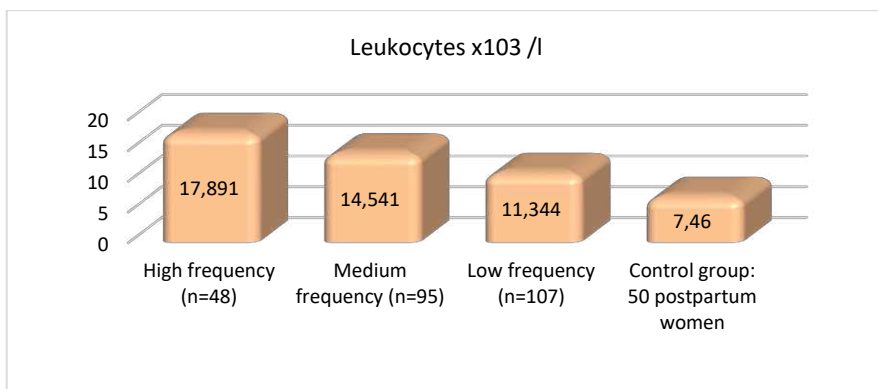
significantly higher than in postpartum women with average wave peaks (n=95) (p<0.001). According to Raman spectroscopy, the amount of leukocytes in the blood of women with average frequency and intensity of wave peaks ($14,541\pm0,935$ x10^3/l) was higher than that of women with low frequency and intensity of peaks (p<0.001). Although the average leukocyte index ($11,344\pm0,87$ x10^3 /l) was lower in the women (n=107) with low frequency and intensity of wave peaks on Raman spectroscopy, itnwas higher than the average level of leukocytes in the control group ($7,46\pm1,521$x10^3 /l). Statistically significant difference between those groups was determined.

CRP, mg/l

High frequency (n=48)	5,904
Medium frequency (n=95)	4,41
Low frequency (n=107)	1,72
Control group: 50 postpartum women	0,37

Graph 4. The average limit indicator of CRP in postpartum women divided into conventional groups according to the frequency and intensity of Raman spectroscopy wave peaks in the study groups

As can be seen from Graph 4, according to Raman spectroscopy the average limit of CRP in the women with high frequency and intensity of wave peaks was 1,494 mg/l higher than in the group of the women with medium frequency. The average limit of CRP in the women with medium frequency and intensity of wave peaks was 2,69 mg/l higher than in the group of the women with low frequency and intensity. The average limit of CRP in the women with low frequency and intensity of wave peaks was 1.35 mg/l higher than control group

of postpartum women. Thus, it can be concluded from the obtained indicators that the level of CRP was also high in postpartum women whose wave peaks on Raman spectroscopy showed very high frequency and intensity. So, the high level of CRP is considered as a predictor of the inflammatory process in the body. In other words, high wave peaks indicate that there is already an inflammatory process in the body. Also, based on the high frequency and intensity of the wave peaks, it is possible to suggest the severity of the inflammatory process.

Leukocytes x103 /l

	High frequency (n=48)	Medium frequency (n=95)	Low frequency (n=107)	Control group: 50 postpartum women
	17,891	14,541	11,344	7,46

Graph 5. The average limit of leukocytes in the blood of postpartum women divided into conventional groups according to the frequency and intensity of Raman spectroscopy wave peaks in the study groups

As can be seen from graph 5, the average limit of leukocytes in the women with high frequency and intensity of wave peaks according to Raman spectroscopy was 3.35×10^3 /l higher than the group of women with medium frequency and intensity, and in the group of the women with medium frequency and intensity it was $3,197 \times 10^3$ /l higher than the group of women with low frequency and intensity. Moreover, the average limit of leukocytes was $3,884 \times 10^3$ /l higher in the group of the women with low frequency and intensity than control group. It can be concluded from the obtained indicators that the quantity of leukocytes was also high in postpartum women whose

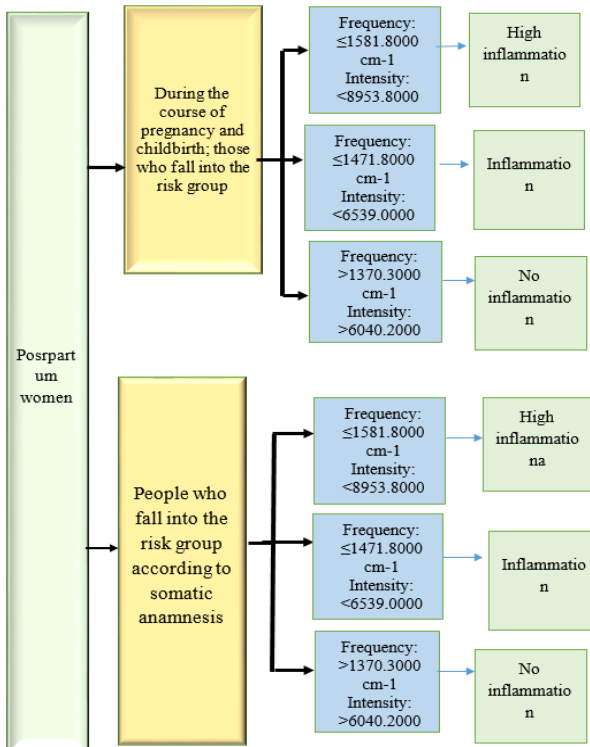wave peaks on Raman spectroscopy showed very high frequency and intensity.

Figure 4. Characterization of the main measurement units (frequency and intensity) of aggravated and non-aggravated forms of inflammatory diseases of the postpartum period based on Raman spectroscopy

Thus, maternal death from purulent-inflammatory diseases of the reproductive period occurs with high frequency. Studying its predictors and timely initiation of examinations is the main issue facing medicine. Raman spectroscopy, which has been developed at the intersection of medicine and exact sciences in recent years, can be used as a unique and innovative method to prevent inflammatory complications of pregnancy and contribute to midwifery practice. All this can lead to a significant reduction in maternal mortality rates.

RESULTS

1. 73 patients (30%) were included to the main group in 2017, 91 patients (37%) in 2018 and 86 (35%) in 2019 in USG carried out on research years. Heterogeneous myometrium was present in 38,1% of the main group and 2,1% of the control group. After childbirth, 98 (98.1%) women had thickening of the endometrium in the main group, while there were no such women in the control group. After childbirth, in the main group 97 (97,1%) women and in the control group 1 (2,1%) woman had excessive growth of the uterus. The difference between the groups was statistically significant (p<0,005) [5,30].

2. On the mentioned risk factors: long-term use of intrauterine contraceptives 24.0±4.27%; high number of spontaneous and arbitrary abortions 30.0±4.58%; the maximum indicators of lack of regular sexual life, such as 30.0±4.58%, were recorded in the groups of women with postpartum complications. Pre-eclampsia (p=0.001) and risk of miscarriage (p=0.048) were identified as sufficiently significant risk factors among the main group of women. [18,23,27,28].

3. In the main group, salpingophoritis was detected in 30%, colpitis in 21%, myoma before pregnancy in 3%, menstrual irregularities in 16%, cervical ectropion in 16%, and ovarian cyst in 5%. The difference between the groups was calculated for salpingoophoritis p=0.002, uterine myoma - p=0.752, menstrual disorders - p=0.628, cervical ectropion - p=0.210, ovarian cyst - p=1.000. In the main group, 19% - ophthalmological pathologies (p=0.408), 20% - ENT-organ diseases (p=0.628), 16% - endocrine disorders, 30% - cardiovascular pathologies (p=0.851), 24% - urinary system diseases (p=0.840), 6% - gastrointestinal diseases (p=0.507) [13,20,30].

4. During the characterization of the infection of the uterine cavity and endometrium in the main group, Mycoplasma Hominis (titr>104) 38.0±4.85%, Ureaplasma urealyticum (titr>104) 73.0±4.44%, respectively, in the control group, It was 2.0±1.98% and 6.0±3.36%. Among the causative agents of inflammatory complications found in the

main group, these two microorganisms were the majority (p<0.05) [3,7,11,12].

5. During evaluation by the Kulbak method, endometrial thickening was determined by an increase in the size of the uterus with an index of J=800.7, uneven expansion of the uterine cavity with an index of J=758.7, heterogeneity of the myometrium with an index of J=128.3 and an index of J=28.0 The growth parameters of the ovaries followed the parameters [10].

6. There was no statistically significant difference in hemoglobin level between the groups. The number of leukocytes in the main group was statistically significantly higher than the control group (p=0,001). There were no differences between the groups in the amount of monocytes (p=0,304). The mean platelet count was statistically significantly lower in the main group than the control group (p=0,001). In the main group, the mean ESR indicator was statistically significantly higher than the control group (p=0,001) [9,14].

7. In the main group on Raman spectroscopy, the average frequency of the spectrogram was significantly different from the average frequency (p<0,001). The spectrogram frequency in the mean of the medium frequency was statistically significant from the mean of the low frequency (p<0,001). Spectrogram low frequency did not statistically significantly differ from control group women's frequency (p=0,27093, p<0,05). The difference between the group of women with high spectrogram intensity (n=48) and women with moderate intensity (n=95) was statistically significant (p<0,001). There were statistically significant differences between medium intensity and low intensity women. The difference between the low intensity and the control group was not statistically significant (p=0,44828, p<0,05). Frequency and intensity parameters of the spectrogram were statistically significantly higher both in the women with inflammation and in the women with high risk of inflammation [2,4,6,8].

8. According to Raman spectroscopy, the average limit of the CRP index was also high in the women with high frequency and intensity of wave peaks. The mean limit of the CRP indicator was high in the group of women with high frequency and intensity of the wave peak (p<0.001). The mean limit of CRP indicator was also statistically high (p<0.001).

Although CRP was lower in postpartum women with low frequency and intensity of peaks, this indicator was statistically significantly higher than the control group (p<0.001). Leukocytes were significantly higher in the women with high frequency and intensity (p<0,001). The amount of leukocytes in women with medium frequency and intensity was higher than that of low frequency and intensity (p<0,001). Although the average index of leukocytes was low in the women with low frequency and intensity, it was higher than the average level of leukocytes in the control group (7,46±1,521 x103 /l). Statistically significant difference between those groups was identified. The level of CRP was also higher in the women with high frequency and intensity. High wave peaks indicate that there is already an inflammatory process in the body [32].

9. For the first time, a new convenient and optimal prediction method, which is an alternative to laboratory-microbiological examinations, has been developed for the purpose of early prediction of inflammation for the women with postpartum inflammatory complications. Based on the conducted studies including the frequency and intensity parameters of Raman spectroscopy, a comparative analysis was made with CRP and leukocyte threshold, which are laboratory parameters of inflammation. Based on the analysis, it is appropriate to use the indicators obtained by Raman spectroscopy of blood samples of postpartum women as early prognostic criteria of inflammation [10,15,19].

9. The reason for early initiation of preventive measures was Raman spectroscopy in the early days of the disease. As a result of this examination, the initiation of the inflammatory process was detected at a very early stage [1,21,29].

PRACTICAL RECOMMENDATIONS

1. The informativeness of Raman spectroscopy in the study of various biological materials in gynecology creates basis for its wide application in practice for this purpose.

2. The prediction of the studied pathology on aggravated and non-aggravated forms of specific inflammatory diseases, such as a high level of infection with conditionally-pathogenic uterine microbiota, exposure to

sexually transmitted inflammatory infections, the presence of somatic diseases, the long-term use of contraceptives, allows the distribution of patients with accuracy on the developing risk of that pathology.

3.In postpartum period, by performing a Raman spectroscopy examination of non-aggravated and aggravated forms of inflammatory diseases, the severity of inflammation is determined according to the frequency and intensity parameters of the wave peaks: high frequency: ≤ 1581.8000 cm^{-1}, Intensity: <8953.8000 (high inflammation); Frequency: ≤ 1471.8000 cm^{-1}, Intensity: <6539.0000 (inflammation); Frequency: >1370.3000 cm^{-1}, Intensity: >6040.2000 (no inflammation).

4. Targeted treatment and prevention is recommended for each group due to the division of inflammatory diseases of the postpartum period into non-aggravated and aggravated forms.

5.The following criteria for non-aggravated and aggravated forms of inflammatory diseases in postpartum women are recommended.

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Şərti ixtisarların siyahısı

BP	–	Bodily Pain
CD	–	cluster of differentiation
EPDS	–	Edinburgh Postnatal Depression Scale
HADs	–	Hospital Anxiety and Depression Scale
HAM-A	–	Hamilton Rating Scale for Anxiety
HAM-D	–	Hamilton Rating Scale for Depression
GH	–	General Health
IL-10	–	Interleukin -10
IL-12	–	Interleukin - 12
IL-5	–	Interleukin - 5
PF	–	Physical component
RP	–	Sexual component
SF	–	Social functionality
SF-36	–	Short Form
VT	–	Activity in life

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