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COMPARATIVE ASSESSMENT OF THE CHARACTERISTICS OF WOMEN WITH BENIGN UTERINE PATHOLOGIES AND REPRODUCTIVE DISORDERS

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Menorrhagic disorders of menstrual function predominated in the group with uterine fibroids (51.5 %), metrorrhagic disorders in the group with endometrial polyps (60.0 %), and dysmenorrhea (42.1 %) in the group with adenomyosis (73.7 %). Primary infertility was more common in the group with endometrial polyps, occurring in 64 % of patients. Among benign uterine pathologies, secondary infertility was more prevalent in the group with endometrial hyperplasia, occurring in 58.1 % of patients. Dopplerographic parameters of the uterine arteries, especially the systolic – diastolic ratio S/D – right uterine artery – 7.28±0.44; S/D – left uterine artery – 7.51±0.41), resistance index (IR – right uterine artery – 0.851±0.011; IR – left uterine artery – 0.862±0.009) and the pycnotic index (PI – right uterine artery – 2.49±0.011; PI – left uterine artery – 2.66±0.11)., were relatively high in patients with adenomyosis. However, in patients with uterine fibroids, these indicators were lower (S/D – right uterine artery – 4.26±0.13; S/D – left uterine artery – 4.62±0.11), than in patients with other benign uterine pathologies. When comparing the results of hormonal tests, it was found that in patients with benign uterine pathologies and reproductive dysfunction, the level of estradiol in the blood was increased (in group I was 97.4±1.5 pg/ml, in group II – 98.6±1.0 pg/ml, in group III – 95.5±0.6 pg/ml, in group IV – 96.0±1.3 pg/ml). However, prolactin levels in patients with adenomyosis were higher (19.9±0.9 ng/mL). The available clinical and instrumental data emphasize the fact that benign uterine pathologies can negatively affect reproductive potential, as well as the practical importance of their early diagnosis.

Key words: benign uterine pathologies, reproductive function disorders, adenomyosis, endometrial hyperplasia, uterine fibroids, endometrial polyp, infertility, miscarriages.

З.С. Гусейнова

ПОРІВНЯЛЬНА ОЦІНКА ХАРАКТЕРИСТИК ЖІНОК ІЗ ДОБРОЯКІСНИМИ ПАТОЛОГІЯМИ МАТКИ ТА ПОРУШЕННЯМИ РЕПРОДУКТИВНОЇ ФУНКЦІЇ

Менорагічні порушення менструальної функції переважали в групі з міомою матки (51,5 %), метрорагічні порушення – в групі з поліпами ендометрія (60,0 %) і дисменорея (42,1 %) – в групі з аденоміозом (73,7 %). Первинне безпліддя частіше зустрічалося в групі з поліпами ендометрію, у 64 % пацієнток. Серед доброякісних патологій матки вторинне безпліддя частіше зустрічалося в групі з гіперплазією ендометрію, у 58,1 % пацієнток. Доплерографічні параметри маткових артерій, особливо систоліко-діастолічне співвідношення S/D – права маткова артерія – 7,28±0,44; S/D – ліва маткова артерія – 7,51±0,41), індекс резистентності (IR – права маткова артерія – 0,851±0,011; IR – ліва маткова артерія – 0,862±0,009). і пікнотичний індекс (PI – права маткова артерія – 2,49±0,011; PI – ліва маткова артерія – 2,66±0,11) були відносно високими у пацієнток з аденоміозом. Однак у пацієнток з міомою матки ці показники були нижчими (S/D – права маткова артерія – 4,26±0,13; S/D – ліва маткова артерія – 4,62±0,11), ніж у пацієнток з іншими доброякісними патологіями матки. При порівнянні результатів гормональних аналізів було встановлено, що у пацієнток з доброякісними патологіями матки і порушенням репродуктивної функції рівень естрадіолу в крові був підвищений (у групі I склав 97,4±1,5 пг/мл, у групі II – 98,6±1,0 пг/мл, у групі III – 95,5±0,6 пг/мл, у групі IV – 96,0±1,3 пг/мл). Однак рівень пролактину в крові пацієнтів з аденоміозом був вищим (19,9±0,9 нг/мл). Наявні клінічні та інструментальні дані підкреслюють той факт, що доброякісні патології матки можуть негативно впливати на репродуктивний потенціал, а також практичну важливість їх ранньої діагностики.

Ключові слова: доброякісні патології матки, порушення репродуктивної функції, аденоміоз, гіперплазія ендометрія, міоми матки, поліп ендометрія, безпліддя, викидні.

Benign pathologies of the uterus – adenomyosis, uterine myoma, hyperplasia, and endometrial polyps are considered one of the most pressing problems of gynecology in the reproductive period [1]. Adenomyosis is one of the benign pathologies of the uterus in women of reproductive age; it is determined by the presence of endometrial glands and stroma in the myometrium of the uterus, and its prevalence ranges from 5 to 70 % [13]. Clinical studies have shown that a significant proportion of women with adenomyosis experience infertility, lower clinical pregnancy and live birth rates, and a higher rate of miscarriage [8]. Studies have also shown that adenomyosis is associated with an increased risk of late miscarriage, preeclampsia, and placental abruption, leading to poor perinatal outcomes [5]. Uterine myoma is the most common benign tumor of the female reproductive system among benign pathologies of the uterus [7]. Although many fibroids are asymptomatic and discovered incidentally, 25 – 30 % of women experience a range of symptoms that aggravate the disease and negatively impact their quality of life [6]. The most common symptoms include abnormal uterine bleeding (AUB), heavy menstrual bleeding (HMB), pelvic pain and pressure, anemia, and urinary and/or bowel dysfunction. At the same time, the presence of fibroids can lead to obstetric complications such as habitual miscarriages, premature birth, abnormal fetal position, an increase in the number of cesarean sections, and postpartum hemorrhage [10].

Endometrial hyperplasia is a condition characterized by excessive thickening of the inner lining of the uterine wall, which can cause heavy bleeding during menstruation [11]. Clinically, endometrial hyperplasia is manifested by abnormal uterine bleeding, but in some cases, it can be asymptomatic and only detected by endometrial biopsy [4]. Endometrial polyps (EP) are focal, sessile, or pedunculated growths of the endometrial mucosa that arise as a result of hyperplastic proliferation of the endometrium and stroma around the vascular core [6]. Patients with endometrial polyps may be asymptomatic, or the most common symptom is abnormal uterine bleeding [15]. Other associated symptoms include abdominal pain, pelvic pain, or infertility. Endometrial polyps can cause infertility and miscarriage in young women [6].

There are several methods for diagnosing benign uterine pathologies. Ultrasound examination is the main method for diagnosing benign pathologies of the uterus. Thus, an individual approach, taking into account multiple factors, is possible to restore fertility and achieve reproductive desire in patients with benign uterine pathologies and reproductive dysfunction.

The purpose of the study was to examine and conduct a comparative analysis of the characteristics of women with benign uterine pathologies and reproductive dysfunctions.

Materials and methods. The study included women aged 18 to 45 years with benign uterine pathology and reproductive dysfunction who visited Maternity Hospital No. 5, named after Shamama Alasgarova, the Clinical Medical Center, and the gynecology department of Maternity Hospital No. 5 between 2017 and 2022. 155 patients with benign uterine pathology and reproductive dysfunction were included in the study. Patients were divided into four groups: group I – included women with adenomyosis and reproductive dysfunction (19 patients), group II – included women with endometrial hyperplasia and reproductive dysfunction (43 patients); group III – included women with uterine fibroids and reproductive dysfunction (68 patients); group IV – included women with endometrial polyps and reproductive dysfunction (25 patients).

A comparative analysis was conducted because benign uterine pathologies (adenomyosis, endometrial hyperplasia, uterine myomatosis, endometrial polyps) are widespread during the reproductive age, have standard pathogenetic mechanisms, similar clinical symptoms (but morphological and functional differences), and have a significant negative impact on reproductive function disorders, and are frequently encountered in clinical practice.

Ethical principles, voluntary consent requirements, and complete data confidentiality were observed during the study.

Inclusion criteria: women aged 18 to 45 years, with benign uterine pathologies (uterine fibroids, adenomyosis, endometrial hyperplasia, endometrial polyps) and reproductive function disorders (infertility or miscarriages).

Exclusion criteria: women under 18 years of age and over 45 years of age, women with reproductive disorders without benign uterine pathologies (infertility and fertility disorders); women with benign uterine pathologies but with reproductive function disorders, patients with combined benign uterine pathologies.

In our study, complaints were collected, and anamnesis data were evaluated. All patients included in the study underwent a physical examination, including determination of body mass index (BMI), and were assessed for menstrual and reproductive function and concomitant extragenital diseases.

Ultrasound was performed using a Samsung Madison, Korean-made SonoAce R7–4D device, using a standard method, directly to the abdomen with the patient's heart rate at 60 – 80 mm/s, or using a standard vaginal probe with a frequency of 3.5 – 7.0 MHz. A Doppler filter at the minimum level (flow filter) – 50 Hz was used for standard Doppler imaging (flow selection image – standard). The speed range in the 4D color Doppler image is 6 cm/sec.

Questionnaires were completed for demographic information (age, BMI, location), and the women's places of residence were examined and compared. The patient's age, social status, somatic history, anthropometric characteristics, gynecological and other diseases, surgeries, characteristics of menstrual and reproductive function, examination, and treatment methods were investigated.

In addition to clinical examination and collection of anamneses from the patients who applied, instrumental studies were also used to clarify the diagnosis and plan the implementation of reproductive desires. The characteristics of Doppler parameters (systolic–diastolic ratio – S/D, resistance index – RI, and pulsatility index – PI) in the uterine artery during the first phase of menstruation were studied.

Hormonal testing was performed to study the role of hormones in patients with benign pathologies of the uterine tract and reproductive disorders. Hormonal examinations were conducted in Baku, mainly at Maternity Hospital No. 5 and "private medical institutions." Examinations were performed using the BioScreen MS–500 automated immunoenzyme analyzer. The examination was performed on the 2nd or 3rd day of menstruation, from 08:00 to 10:00 in the morning, with all legal requirements for the examination being observed. The normative indicators are the ranges of hormones used in the test systems in the following units of measurement (Estradiol (E2) – pq/ml, follicle – stimulating hormone (FSH) and

luteinizing hormone (LH) – mİU/mL, Progesterone (P) – ng/ml, total testosterone (T), thyrotropin (TTH) and prolactin (Prl) – ng/ml).

Anemia and obesity can affect reproductive function, hormonal background, and the course of benign pathologies of uterine. The analyses were mainly performed using the CORMAY Multi + device. The diagnosis of anemia was based on hemoglobin (HB), hematocrit (HT), and erythrocyte counts. The criterion for anemia was: HB<120 g/l (according to WHO standards and the Ministry of Health of the Republic of Azerbaijan (2009) "Clinical protocol for the diagnosis and treatment of iron deficiency anemia").

The indicators for diagnosing obesity were body mass index (BMI) and, WHO classification. BC – 418 MA, Japan; height measuring device Seca 213, Germany. Classification of BMİ: normal (18.5 – 24.9), overweight (25 – 29.9), obesity (>30).

During the study, patients did not undergo any additional interventions, and examinations and treatments were performed in accordance with existing clinical protocols. Since the study was retrospective and observational, it posed no additional risk to patients' health. Participation in the study was based on informed voluntary consent. Patients were informed that they had the right to withdraw from the study at any stage without giving a reason. Confidentiality and anonymity of patient information are ensured.

The study was conducted in accordance with international and national ethical standards for biomedical research on humans, as well as the basic principles of ethics and bioethics (voluntariness, non–harm, justice).

In addition to clinical examination and collection of anamneses from patients who applied, instrumental studies were used to clarify the diagnosis, and plans for the implementation of reproductive desires were obtained from all patients.

In our study, quantitative and qualitative data were statistically processed using analysis of variance (Student-Bonferroni test and Mann–Whitney test) and discriminant analysis (Pearson chi–square test) in the SPSS–26 statistical packages. If the P value was <0.05, the null hypothesis was rejected.

Results of the study and their discussion. Among women with benign uterine pathology and reproductive dysfunction, adenomyosis (42.1 %) and endometrial polyps (36.0 %) were more often observed in women over 34 years of age. A significant difference was found between the groups with benign uterine pathologies: endometrial hyperplasia, uterine fibroids, and endometrial polyps, depending on the body mass index (P_{II-IV}=0.012, P_{III-IV}=0.011). Obesity was observed in 5 (11.6 %) and 8 (11.8 %) patients with endometrial hyperplasia and uterine fibroids, respectively. To determine the clinical and anamnestic characteristics of the examined patients, a comprehensive analysis of the clinical indicators obtained in the compared groups was performed by type of endometrial pathological process. In the anamnesis of patients with endometrial polyps and reproductive dysfunction, grade I anemia was predominant, and in patients with adenomyosis and reproductive dysfunction, grade II anemia was predominant.

Thus, grade II anemia was detected in 4 (21.1 %) patients in group I, in 1 (2.3 %) patient in group II, in 10 (14.7 %) patients in group III, and in 1 (4.0 %) patient in group IV. Grade III anemia was detected in 1 (2.3 %) patient in group II and in 2 (2.9 %) patients in group III. Arterial hypertension was more common in group II than in group III in 10 (14.7 %) and 7 (16.3 %) patients, respectively; no significant difference was found between the groups. Among the patients in group II, polycystic ovaries predominated, detected in 23 (53.5 %) patients, and a significant difference was found between the groups (P_{I-II}<0.001, P_{II-III}<0.001, P_{II-IV}<0.001). Among benign uterine pathologies, in group III, menarche began (12.9±0.1 years) earlier than in other groups. The duration of menstruation averaged 8.0±0.3 days in group III, 7.3±0.4 days in group I, 7.1±0.3 days in group II, 6.2±0.3 days in group IV. There was a significant difference between patients in group III and I, as well as II and IV (P_{I-III}= 0.012, P_{II-III}<0.001, P_{III-IV}<0.001). Menstrual cycle disorders were observed in all groups with benign uterine pathology. Menstrual cycle duration (<21) of less than 21 days was observed in 25 (36.8 %) patients in group I with uterine fibroids of type I. Menorrhagia was also detected in 35 (51.5 %) women with uterine fibroids. A statistical difference was found between Group II and group III, and between groups II and IV (P_{II-III}=0.032, P_{II-IV}=0.010). Among benign uterine pathologies, menstrual cycle disorders with metrorrhagia were more common in groups IV and I – they were detected in 15 (60.0 %) and 8 (42.1 %) patients, respectively, while a significant difference was found between the groups (P_{III-IV}=0.046). Dysmenorrhea was prevalent in group I and occurred in 14 (73.7 %) patients. A significant statistical difference was found between the groups (P_{I-II}<0.001, P_{I-III}<0.001, P_{I-IV}<0.001, P_{II-III}=0.003, P_{II-IV}=0.007).

Infertility was detected in 112 (72.3 %) patients with benign uterine pathology and reproductive dysfunction. Among these, primary infertility was observed in 62 (55.4 %) patients, and secondary infertility in 50 (44.6 %). Primary infertility was more common in group IV and was detected in 16 (64 %) patients. Secondary infertility was predominant in group I and was observed in 25 (58.1 %) patients. A significant difference was found between the groups (P_{I-II}=0.018, P_{II-III}<0.001, P_{II-IV}<0.001).

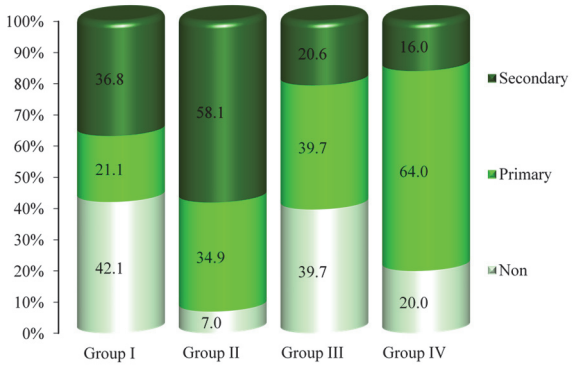

Fig. 1. Characteristics of infertility in women with benign uterine pathology.

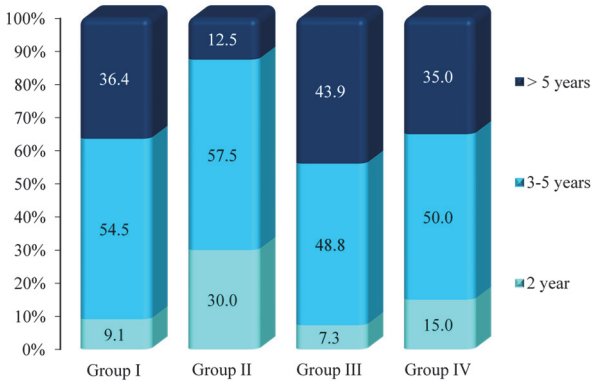

Fig. 2. Duration of infertility in women with benign uterine pathology.

In the group with endometrial hyperplasia, among patients with benign uterine pathologies, patients with infertility lasting 2–5 years predominated; accordingly, in 12 (30.0 %) patients, infertility lasted 2 years, and in 23 (57.5 %) patients, it lasted 3 – 5 years. Among patients with benign uterine pathology, the frequency of infertility lasting more than 5 years was higher in patients with uterine fibroids and was observed in 18 (43.9 %) patients; a difference was found between the groups ($P_{II-III}<0.001$, $P_{II-IV}=0.026$). In groups with uterine myoma and reproductive dysfunction, spontaneous miscarriages predominated, occurring in 34 (50.0 %) patients. Among them, spontaneous late miscarriages were observed in 7 (10.3 %) patients. Thus, patients with spontaneous miscarriages had a significant difference ($P_{II-III}=0.001$) between groups II and III. Habitual miscarriages (in patients with a history of more than 3 early or late miscarriages) were observed in 7 (36.8 %) patients in group I and in 26 (38.2 %) in group III, a significant difference was found between the groups ($P_{I-II}=0.003$, $P_{II-III}<0.001$, $P_{III-IV}=0.043$). Preterm birth occurred in 21 (30.9 %) patients in group III and was more common than in other groups, with a statistical difference between the groups ($P_{I-III}=0.024$, $P_{II-III}=0.003$). Primary diagnosis of benign uterine pathology was performed using transvaginal ultrasound examination in the I phase of menstruation. The nature, location, size, quantity, thickness and other characteristics of uterine pathologies were identified and compared using ultrasound examination. To clarify the role of uterine blood supply in patients with benign uterine pathology, spectral Doppler ultrasound examination of the uterine artery was performed. The resistance index (RI), pulsation index (PI), and systolic–diastolic ratio (S/D) were selected as the main parameters of Doppler indicators and compared.

As can be seen from the table, the systolic–diastolic ratio (S/D – M±m) of blood flow velocity in the uterine artery in patients with adenomyosis and reproductive dysfunction was higher than in other benign pathologies of the uterus and reproductive dysfunction. The resistance index, used to qualitatively assess blood flow in the uterine arteries, was lower in patients with uterine myoma than in other groups, whereas it was higher in patients with adenomyosis than in other groups. The pulsatility index (PI) was higher in the adenomyosis group than in the other groups. The PI in the group with endometrial hyperplasia was lower than in the group with adenomyosis, and higher than in the groups with uterine fibroids and polyps. The PI index in the group with uterine myoma was lower than in the group with other benign uterine pathologies, and the difference was statistically significant. The PI index in the group with endometrial polyps was lower than in the group with adenomyosis, but higher than in the group with uterine myoma, and did not differ from the PI values in patients in the group with endometrial polyps.

Hormonal studies were conducted to investigate hormonal imbalances in patients with benign uterine pathology and reproductive dysfunction, as well as to study the similarities and differences between them in the relevant indicators. Thus, the level of estradiol in the blood of patients in group I was 97.4±1.5 pg/ml, in patients in group II – 98.6±1.0 pg/ml, in group III – 95.5±0.6 pg/ml, in patients in group IV – 96.0±1.3 pg/ml. A statistically significant difference was revealed between groups II and III. ($P_{II-III}=0.026$). During the examination, the levels of follicle–stimulating hormone (FSH – 6.45±0.32, 6.27±0.23, 6.40±0.16, 6.32±0.24 IU/l) and luteinizing hormone (LH – 5.57±0.33, 5.34±0.15, 5.30±0.19, 5.28±0.30 IU/l) in the blood did not differ between the groups with benign uterine pathology. The level of prolactin hormone in the blood was higher in group I than in the other groups (19.9±0.9 ng/ml). In group II, the level of prolactin in the blood (17.6±0.4 ng/ml) was lower than in group I, and higher than in groups III and IV. As a result of observations, it was found that the level of prolactin in the blood of group III (16.8±0.3 ng/ml) was lower than in groups I and II, and higher than in group IV. In group IV (14.9±0.6 ng/ml), the level of prolactin in the blood was lower than in other groups. A statistically significant difference was found between the groups ($P_{I-II}<0.001$, $P_{I-III}<0.001$, $P_{I-IV}<0.001$, $P_{II-IV}<0.001$, $P_{II-IV}=0.012$). Blood androgen levels (total testosterone and dehydroepiandrosterone sulfate) and thyroid–stimulating hormone levels showed virtually no difference between the groups. Blood progesterone levels corresponded to those

of the second phase of the menstrual cycle (17.7±0.4, 17.7±0.4, 17.2±0.4, and 17.9±0.4 ng/ml); no differences were found between the groups. In all groups, patients with benign uterine pathology experienced rupture of membranes, which is considered one of the pathologies of pregnancy. In the group with this pathology, 11 (68.8 %) patients with endometrial hyperplasia and 26 (60.5 %) patients with uterine fibroids were identified. In the comparison groups, the risk of early miscarriage in the first trimester of pregnancy was identified. Cervical insufficiency was observed in 8 (15.7 %) patients in group III. The risk of preterm birth was higher in patients with adenomyosis and uterine myoma than in other groups, and the statistically significant difference between the groups was P_{I-II}=0.004, P_{I-IV}=0.004, P_{II-III}=0.002, P_{III-IV}=0.003. As a result of pregnancy, the number of cesarean sections in patients with benign uterine pathology exceeded the number of physiological births. No significant differences in birth and neonatal outcomes were observed during pregnancy based on pathogenetic treatment.

Table 1

Characteristics of Doppler parameters in the uterine arteries

Indicators	Groups	N	M	±m	Me	Q1	Q3	P_I	P_{II}	P_{III}
S/D – right uterine artery	I	19	7.28	0.44	7.69	5.36	8.49			
	II	43	5.50	0.19	5.32	4.54	6.42	0.001*		
	III	68	4.26	0.13	4.25	3.47	4.95	0.001*	0.001*	
	IV	25	5.45	0.32	5.07	4.25	6.47	0.003*	0.508	0.001*
IR – on the left uterine artery	I	19	7.51	0.41	6.93	6.21	9.49			
	II	43	5.89	0.18	5.91	5.05	6.58	0.001*		
	III	68	4.62	0.11	4.58	4.10	5.13	0.001*	0.001*	
	IV	25	5.56	0.27	5.34	4.45	6.23	0.001*	0.258	0.001*
IR on the right uterine artery	I	19	0.851	0.011	0.870	0.810	0.880			
	II	43	0.809	0.006	0.810	0.780	0.840	0.001*		
	III	68	0.752	0.007	0.765	0.710	0.800	0.001*	0.001*	
	IV	25	0.803	0.010	0.810	0.760	0.840	0.001*	0.683	0.001*
IR – on the left uterine artery	I	19	0.862	0.009	0.860	0.840	0.900			
	II	43	0.824	0.005	0.830	0.800	0.850	0.001*		
	III	68	0.773	0.006	0.780	0.755	0.800	0.001*	0.001*	
	IV	25	0.812	0.008	0.810	0.790	0.840	0.001*	0.227	0.001*
PI – on the right uterine artery	I	19	2.49	0.11	2.52	1.96	2.91			
	II	43	2.01	0.06	1.98	1.67	2.32	0.001*		
	III	68	1.69	0.03	1.71	1.64	1.82	0.001*	0.001*	
	IV	25	1.94	0.11	1.92	1.51	2.26	0.003*	0.611	0.018*
PI – on the left uterine artery	I	19	2.66	0.11	2.49	2.32	3.19			
	II	43	2.11	0.05	2.04	1.85	2.34	0.001*		
	III	68	1.79	0.02	1.77	1.69	1.92	0.001*	0.001*	
	IV	25	2.10	0.08	1.99	1.77	2.35	0.001*	0.924	0.001*

Note: statistical significance of the difference between the indicators: P_I – adenomyosis group according to Wilcoxon (Mann–Whitney), P_{II} – endometrial hyperplasia group according to Wilcoxon (Mann–Whitney), P_{III} – uterine fibroids group according to Wilcoxon (Mann–Whitney), P_{IV} – endometrial polyps group according to Wilcoxon (Mann–Whitney), * – the "0" hypothesis is rejected ($p<0.05$)

Among benign uterine pathologies, our study did not reveal any significant difference in their frequency among patients in the middle reproductive age group. Adenomyosis and reproductive dysfunction were more common in women over 34 years of age. The global pandemic of increasing obesity among women is a significant risk factor for the development of pathological changes in the endometrium [2]. When comparing anthropometric parameters, body mass index was higher in patients with adenomyosis, endometrial hyperplasia, and uterine myoma, and obesity was observed in those with endometrial hyperplasia and uterine myoma. According to another study, early menarche is associated with indicators of uterine fibroid severity [12]. Accordingly, in our study, menarche occurred earlier in patients with uterine myoma than in those with other benign uterine pathologies, and the duration of menstruation was longer. In most patients with benign uterine pathology, posthemorrhagic anemia occurred against the background of menstrual cycle disorders characterized by menorrhagia and metrorrhagia. In the group with uterine myoma, menorrhagic disorders of menstrual function predominated, in the group with adenomyosis and endometrial polyps – metrorrhagic disorders, in group I – dysmenorrhea. Endometrial pathology is a well–recognized cause of infertility and recurrent implantation failure, with a prevalence rate exceeding 30 % [14]. In our study, primary infertility was predominant in group IV, and secondary infertility was predominant in group II. When pregnancy occurred, the most common pregnancy complications in the group with uterine fibroids were spontaneous miscarriages and premature births. Doppler measurements of uterine arteries have high sensitivity and specificity for diagnosing high uterine blood flow resistance [3]. Thus, in our study, uterine artery RI and PI were higher in patients with adenomyosis and reproductive dysfunction than in other groups. However, unlike in other groups, Doppler parameters were lower in group

III. Endometrial hyperplasia, defined by a disorder of endometrial gland proliferation, occurs as a result of estrogenic stimulation of endometrial tissue with a relative lack of the counterbalancing effect of progesterone, which in clinical practice is often referred to as “insurmountable” [9]. Patients with benign uterine pathology and reproductive dysfunction had high levels of estradiol in the blood, but a statistically significant difference was noted between endometrial hyperplasia and uterine fibroids. Blood prolactin levels were higher in women with adenomyosis, and the difference between the groups was significant. No significant difference was found in birth and neonatal outcomes between those receiving appropriate treatment before and during pregnancy and those who did not. Thus, only an individualized, multifactorial approach allows us to solve complex clinical problems in patients with benign uterine pathologies.

Conclusion

In patients with benign uterine pathology, posthemorrhagic anemia was observed due to menstrual cycle disorders, characterized by menorrhagia and metrorrhagia. Menorrhagic disorders of menstrual function predominated in the group with uterine fibroids, metrorrhagic disorders in the group with endometrial hyperplasia and polyps, and dysmenorrhea in the group with adenomyosis**.** Infertility, which characterizes reproductive dysfunction, was identified in all groups with benign uterine pathology: primary infertility was more common in groups with endometrial polyps, and secondary infertility in groups with endometrial hyperplasia. In groups with uterine fibroids, the most common pregnancy complications were early (in the 1st trimester) and late miscarriage (in the 2nd trimester). Among benign uterine pathologies, Doppler indices in uterine vessels were higher in patients with adenomyosis and reproductive dysfunction than in those with other pathologies, and the difference was significant. In patients with uterine myoma, Doppler ultrasound indices of the uterine arteries were lower than in other benign uterine pathologies; in patients with endometrial hyperplasia and polyps, these indices were lower than in patients with adenomyosis and higher than in patients with uterine myoma. In patients with benign uterine pathology and reproductive dysfunction, high levels of estradiol in the blood were observed, but a statistically significant difference was noted between endometrial hyperplasia and uterine fibroids, and prolactin levels were higher in the group with adenomyosis. Thus, no differences in birth and neonatal outcomes were observed despite appropriate treatments administered before and during pregnancy.

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