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Effect of hysterectomy with opportunistic salpingectomy for uterine fibroids on the development of genitourinary syndrome and ways of its reduction

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Abstract

The article presents the assessment and analysis of the most important predictors and manifestations of genitourinary disorders in women of reproductive age after radical surgical treatment for uterine fibroids in the remote postoperative period. Ways of reducing the severity of symptoms are offered.

The aim of the study – to establish the influence of hysterectomy with opportunistic salpingectomy for uterine fibroids on manifestation and progression of genitourinary syndrome and ways of the reduction in its severity.

Materials and methods. Comprehensive clinical and laboratory assessment of the impact of hysterectomy with opportunistic salpingectomy for uterine fibroids on the

development of metabolic syndrome was conducted at the gynecological department of the “Kyiv Perinatal Center”. The study included 160 women: 90 patients underwent vaginal classical and laparoscopic hysterectomy including fallopian tubes removal; and 70 patients underwent abdominal hysterectomy including fallopian tubes removal. Data on the assessment of pelvic floor condition and urogenital dysfunction were provided using a standardized POP-Q system, both at the stage of preoperative observation and for 1, 3 and 5 years after the surgery.

Research results and their discussion. The most important risk factors that allow forming groups of patients requiring individualized approach in the choice of surgical techniques and rehabilitation program were pointed out. The obtained results allowed to isolate UCDT markers in fractions above 20%. 19 women (11.86%) underwent ovarian surgeries and used gonadotropin-releasing hormone agonists. Genitourinary and sexual disorders were diagnosed in 27 cases (19.3%) 12 months after surgery. Vaginoscopy, performed 12 months after surgery, revealed atrophic vaginitis in 58 cases (36.25%) without significant difference in groups. Microscopy of urogenital smears was in norm only in 51 patients (31.86%). Complaints of dysuria were most common among patients (59 – 36.85%). The combination of sexual disorders and other manifestations (flatulence and intestinal discomfort, stool problems, vaginal microbiota disorders, pelvic floor descent, etc.) was revealed in a quarter of women (28 – 17.50%), and more often – after vaginal hysterectomy (17 – 18.89%). Clinical symptoms of urinary incontinence were observed against the background of a negative cough test in almost a third of patients (49 – 30.63%). They were combined with pollakiuria, nocturia, and imperative urgency, exacerbated by alcohol and accompanied by cystalgia and genital prolapse. The use of low doses of estradiol in the rehabilitation program improved the clinical and laboratory parameters of the urogenital tract, reducing the incidence of vulvovaginal atrophy by 13%, normalizing the biocenosis and vaginal pH, reducing clinical manifestations of urinary incontinence (pollakiuria and nocturnal pollakiuria) by 14%, feeling of incomplete bladder emptying – by 15%, stress urinary incontinence – by 16%, vaginal prolapse – by 11%, compared to the group with standard postoperative management, as well as reducing the severity of psycho-emotional and vegetative-vascular manifestations.

Conclusion. The expected effect of surgical recovery may be insufficient, and clinical symptoms of genitourinary syndrome may manifest in the postoperative period, which requires the development of clear algorithms for diagnosing urinary incontinence and pelvic floor failure in the preoperative stage and application of long-term preventive measures after

hysterectomy in the remote postoperative period. There is no statistically significant difference in the development of genitourinary syndrome with different surgical approaches.

Key words: hysterectomy with opportunistic salpingectomy; genitourinary syndrome; rehabilitation program.

Introduction

Hysterectomy is the second most frequent surgical procedure after cesarean section in women of reproductive age in the world and in Ukraine, in particular. More than 600,000 hysterectomies are performed annually in the United States, and approximately 20 million American women have undergone a hysterectomy [1]. More than half of all hysterectomies involve women younger than 44 years, with the highest rate among patients aged 40 to 44 years [2]. Besides, hysterectomy, according to the literature, is a risk factor for urinary incontinence [5]. It should be mentioned that radical surgery, even with the preservation of ovarian tissue, causes steroid imbalance. The urinary system organs, as well as the reproductive ones, are target organs for sex hormones [6]. First of all, noradrenergic neurons, located in the fornices of the vagina, are highly sensitive to estrogen; they are involved in maintaining the tone of the urethra and vaginal wall. Estrogen deficiency can cause atony of the vaginal walls and the development of their prolapse. This not only reduces the number of estrogen receptors in the tissues of the genitourinary tract, but also decreases the sensitivity of muscarinic receptors to acetylcholine and the sensitivity of myofibrils to norepinephrine, which reduces the contractility of the urethral sphincter and detrusor. In addition, there is a violation of the proliferative processes of the vaginal epithelium, inhibition of mitotic activity of cells, especially of the basal and parabasal layers. Due to the impaired blood flow, hypoxia results in apoptosis of smooth muscle cells and disruption of the innervation of this area [7]. Owing to progressive atrophic changes in the vagina and urethra the following changes are observed: fragmentation of elastic and hyalinosis of collagen fibers, decrease in glycogen content in the vaginal epithelium, decrease in lactic acid concentration and, as a consequence, increase in vaginal pH, elimination of lactobacilli – the main component of vaginal biocenosis. Colonization by both exogenous and endogenous microorganisms occurs. Under such conditions, a woman's body weakens the mechanisms of local protection, which facilitates its infection [8, 9].

The urgency of studying this problem is due to the variety of combinations of gynecological and urological pathologies – from stress urinary incontinence (without and with imperative urges and increased detrusor tone), cystalgia, nocturia – to the vaginal wall

prolapse with mucosal dryness, decreased lubrication, development of ulcers or cracks, coital insufficiency and other sexual disorders. Such clinical symptoms have a negative impact on the physical, psycho-emotional status and social significance of a woman in society, the phenomenon of so-called psychosocial discomfort develops [10]. “Rejuvenation” of age categories of women with hysterectomy adds importance to the social aspects of this problem. These issues are also quite relevant because the neurovegetative and vasomotor manifestations that accompany posthysterectomy syndrome tend to improve even without specific hormone therapy, while the symptoms of genitourinary syndrome persist and progress, which leads to significant deterioration of the quality of life. At the same time, in recent years, the attention to assessing the quality of life of modern women has been increased. The issue of expanding the implementation of modern high-tech methods of treatment of genital pathology, timely diagnosis, development and use of surgical methods for prevention and correction of urogenital disorders remains relevant.

The aim of the study – to establish the influence of hysterectomy with opportunistic salpingectomy for uterine fibroids on the manifestation and progression of genitourinary syndrome and ways of the reduction in its severity.

Materials and methods of research. During the research at the gynecological department of Municipal Non-Profit Enterprise “KYIV PERINATAL CENTER” the retrospective analysis of 760 cases of hysterectomy for the period 2015-2019 was conducted. The next step was a comprehensive assessment of the impact of hysterectomy with opportunistic salpingectomy for uterine fibroids on quality of life of 160 women of reproductive age, who were divided into two groups: Group 1 – 90 patients aged 45.9 ± 1.3 years who underwent vaginal hysterectomy along with fallopian tubes removal, both classical and associated with laparoscopy; Group 2 – 70 patients who underwent abdominal hysterectomy along with fallopian tubes removal, mean age 47.2 ± 1.6 years. The control group included 50 women with asymptomatic fibroids of reproductive age 45.7 ± 1.3 years. The diagnostic algorithm included assessment of pelvic floor condition and urogenital dysfunction using a standardized POP-Q system, both at the stage of preoperative observation and for 12 months, 3 and 5 years after surgery. The study also included conducting a survey, keeping pain diary and bladder diary, physical examination, determination of the vaginal pH, vaginoscopy, assessment of the index of the vagina, the state of the microbiota of the mucous membranes, comprehensive urodynamic examination, cystometry. Cough test, Valsalva test, pad test, “stop test” with Kegel cones, etc. were used to assess the signs of pelvic floor failure and pelvic organ dysfunction. The International Continence Society (ICS) classification was

used to assess the severity of urinary incontinence. Criteria for inclusion in the study were: the age of patients from 40 to 49 years, hysterectomy for uterine fibroids with opportunistic salpingectomy with preservation of ovarian tissue, patients' consent to participate in the study. Exclusion criteria were: severe somatic diseases leading to the patient's premorbidity before surgery, patients' refusal to participate in the study. The effectiveness of the proposed algorithm was evaluated in two groups: the main group with a program of preventive measures, which included 46 patients with vaginal HE and 36 women with abdominal HE; and the comparison group (44 patients with vaginal HE and 34 women with abdominal HE). Postoperative monitoring was carried out in accordance with generally accepted principles.

The algorithm included the following therapeutic options: estradiol 50 mcg per day as a transdermal patch six weeks after hysterectomy for patients who had no contraindications (no changes in mammography, Doppler scan of the vessels of the lower extremities), if necessary – in combination with topical estrogens in the form of vaginal cream and local preparations of lactobacilli.

Statistical processing of the material was performed using the Microsoft Excel application program, package "STATISTICA – 8.0".

All questions regarding the possibility of conducting these studies were agreed with the Commission on Bioethical Expertise and Ethics of Scientific Research of Bogomolets National Medical University protocol No. 140, dated 21.12.2020. The study was performed with the analysis of medical records before surgical recovery in retrospect; all patients gave their voluntary consent to the examination and questionnaire. Research was based on ethical standards in accordance with the Helsinki Declaration of the World Medical Association.

Research results and their discussion

The analysis of clinical and anamnestic data at the preoperative stage is presented in Table 1. It reveals chronic anemia in 91 women (56.87%), which correlates with menometrorrhagia. This fact explains the feasibility of surgery. Thyroid dysfunction was noted in almost one in five cases, which may indirectly indicate a violation of the regulation of steroidogenesis by the ovaries. Almost a third and a quarter of women had manifestations of neuroendocrine symptoms, such as premenstrual syndrome and algodysmenorrhea. 19 women (11.86%) had ovarian surgery and used gonadotropin-releasing hormone agonists. These conditions should be considered the predictors of hypoestrogenism in the postoperative period in this category of patients.

Table 1

Clinical and anamnestic data in the studied cohort of patients at the preoperative stage,
abs.num.,%

Parameters	Group of patients with HE, p=160		Control group, p=50
	Group 1, p=90	Group 2, p=70	
Cardiovascular diseases (mitral valve prolapse, VSD)	22 (24.44%)	11 (15.71%)	3 (6.0 %)
Vegetovascular dystonia of the hypertensive type	20 (22.22%)	24 (34.28%)	11 (22.00%)
Varicose vein disease	23 (25.56%)*	21(30.00%)*	4 (8.0 %)
Nephroptosis, renal micro-anomalies	20 (26.7%)*	16 (22.9%)*	2 (4.0 %)
Myopia	18 (20.00%)	19 (27.14%)*	5 (10.0 %)
Hernias of different localization	14 (15.56%)	12 (17.14%)	2 (4.0%)
Chronic gastrointestinal diseases with impaired motor function	16 (17.78%)	11 (15.71%)	2 (4.0%)
Chronic diseases of the respiratory system	17 (18.89%)	10 (14.29%)	2 (4.0%)
High BMI	31 (34.44%)	19 (27.14%)*	7 (14.00%)
Iron deficiency anemia	50 (55.56%)*	41 (58.57%)*	5 (10.00%)
Thyroid dysfunction	12 (13.33%)	12 (17.14%)*	4 (8.00%)
Chronic inflammation of the uterine appendages	32 (35.55 %)*	26 (37.14 %)*	4 (8.00 %)
Algodysmenorrhea	22 (24.44%)	14 (20.00 %)	3 (6.00%)
Menometrorrhagia	31 (34.44%)	28 (40.00%)	0
Premenstrual syndrome	24 (26.67 %)	19 (27.14 %)	2 (4.00 %)
Multiple parity (more than 3 babies)	24 (26.67%)	12 (17.14 %)	4 (8.00 %)
Fetal macrosomia	26 (28.89 %)**	16 (22.86%)*	5 (10.00%)
Birth injuries to mothers, episiotomy	37 (41.11%)*,**	21 (30.00%)*	5 (10.00%)

Notes:

1. * – the difference is statistically significant relative to the parameters of the control group, $p < 0.05$;
2. ** – the difference is statistically significant relative to the parameters of Group 2, $p < 0.05$.

Peculiarities of reproductive function indicate a higher proportion of traumatic births with perineal dissection, especially in Group 1 (41.11%), large fetus (28.89%) and surgery during vaginal birth (up to 20.00%) in patients with classical vaginal hysterectomy. High parity was noted in 24 women (26.67%) of Group 1. This could affect the anatomical and physiological integrity of the pelvic floor and serve as predictors of vaginal prolapse. On the other hand, women in the study groups had a significant proportion of indirect signs of

undifferentiated connective tissue dysplasia (UCTD), which is known to be an independent risk factor for genital prolapse [11]. The obtained results distinguish the following markers of UCTD: micro-anomalies of the cardiovascular system (mitral valve prolapse, additional ventricular chord) and urinary system (nephroptosis) – in similar proportions above 20%; intestinal motility disorders (GERD, gastroptosis, predisposition to constipation) – about 15%; varicose disease of the pelvis and lower extremities – almost a third; hernias of different localization – 16.86%. It should be noted that half of the patients had weak uterine ligaments, 22 women (13.75%) had sacroiliac joint dysfunction. At the same time, probable predictors of the development of metabolic syndrome have been identified; they are high body mass index and vegetovascular dystonia of the hypertensive type.

After the hysterectomy with the use of various techniques and surgical approaches, according to the questionnaires, there was a clear improvement in physical comfort in women in both groups due to the improvement of clinical symptoms of uterine fibroids, reducing the role of pain and blood loss. At the same time, dynamic changes in the quality of life parameters, associated with the psycho-emotional sphere of women, were revealed in 79 (56.4%) cases. High frequency of psycho-emotional disorders after hysterectomy starts in the early postoperative period. Such women experience a sense of loss of femininity, inferiority of their feminine nature, fear of possible social isolation and family disorders, the need to form an appropriate attitude and adapt to a new life situation [10]. There is also the so-called “postoperative fatigue syndrome” (POFS), the main manifestations of which are psycho-emotional and psychosomatic symptom complex. POFS has an adaptive nature, but can become protracted, triggering a number of pathological processes that cause maladaptation of many organs and systems, and health in general [12]. There are data on the impact of hypoestrogenic state caused by impaired blood supply to ovarian tissue after hysterectomy (especially with opportunistic salpingectomy) on emotional status [13]. On the other hand, the progression of psycho-emotional disorders is facilitated by genitourinary and sexual disorders, which were found in 27 (19.3%) cases 12 months after surgery. They worsen over time, apparently under the influence of progressive ovarian steroidogenesis.

Vaginoscopy, performed 12 months after hysterectomy with opportunistic salpingectomy, showed an increase in clinical manifestations of hypotrophic process of the vaginal mucosa, namely a decrease in folds, dryness, bleeding and predisposition to trauma in 58 patients (36.25%). However, as the results show, the rates of vulvovaginal atrophy, according to the Barlow scale, were higher in patients >45 years of age, which confirms the role of hypoestrogen in the mechanisms of trophic changes in the mucosa. The majority of

patients (27 women, 16.86%) rated their condition on the Barlow scale in 2-3 points; they pointed to discomfort worsening their daily life and other disorders of moderate severity. Disorders of a medium severity degree were marked by 13 patients (8.13 %); 18 women (11.25%) noted more severe violations. Microscopy of urogenital smear showed normal values only in 51 cases (31.86%, $p<0.05$), represented by the association of lactobacilli and gram-positive cocci, in particular in 21 women of Group 1 and in 30 patients of Group 2. Some patients (49–30.63%) were diagnosed with bacterial vaginosis with a high microbial count and a predominance of gardnerella morphotypes. It should be noted that nonspecific inflammation in the vaginal ecosystem of the examined patients was characterized by the following bacterioscopic signs: leukocytosis, mixed microflora represented by gram-positive cocci and rods, bacteroids, fusobacteria, gardnerella, low microbial count of lactobacilli, without obvious signs of inflammatory edema and hyperemia. The negative impact of estrogenic imbalance, initiated by the radical volume of surgical recovery, is indicated by the average indicators of the vaginal health index, which are the lowest in Group 1.

Table 2

The severity of vulvovaginal atrophy according to the Barlow scale and manifestations of urogenital disorders, based on the calculation of the vaginal health index in women of the study groups 12 months after hysterectomy, points, $M\pm m$

Group of patients	Severity of vulvovaginal atrophy according to the Barlow scale, points, $M\pm m$	Vaginal health index, points, $M\pm m$
Group 1	2.12±0.12	2.01±0.12*
Group 2	2.34±0.46	2.66±0.22
Control group	2.96±0.20	4.82±0.09

Note. * – the difference is statistically significant relative to the control group, $p<0.05$.

Many complaints of dysuria (59 – 36.85%) were noted during the study of urogenital status. Almost a quarter of patients (28 – 17.50%) had a combination of sexual disorders, flatulence and intestinal discomfort, stool problems, vaginal microbiota disorders, pelvic floor descent, etc., more often after vaginal hysterectomy (17 – 18.89%). Clinical manifestations of urinary incontinence were observed against a negative cough test in almost a third of patients (49 – 30.63%); they were combined with pollakiuria, nocturia, urgency, exacerbated by alcohol, accompanied by cystalgia and genital prolapse. And interestingly, the UCTD markers were revealed in the same patients at the preoperative stage.

The prerequisite for achieving successful and effective treatment is a full examination, formation of risk groups and the choice of a sound rehabilitation program. We have proposed

a diagnostic algorithm, which includes tests to diagnose the initial symptoms of urinary incontinence and pelvic floor failure in the preoperative stage: analytical assessment of questionnaires (ICI-SF), bladder diaries, and assessment of quality of life. Objective methods include assessment of general status, body mass index, laboratory and bacteriological examinations, as well as a number of samples (cough test, Valsalva test, etc.). If necessary, consultation of related specialists, the diagnosis of renal function, uroflowmetry to determine residual urine, urethrocystoscopy, cystometry and urodynamic studies to determine the condition of the sphincter of the urethra and the choice of surgery are proposed. Taking into account the obtained data on signs of changes in the hormonal status of operated patients in the postoperative period, we recommend the following preventive measures: use of estradiol six weeks after hysterectomy in combination with topical estrogens vaginally for minimal correction and the use of vaginal pre- and probiotics with vitamin D to prevent nonspecific vulvovaginitis.

The effectiveness of the proposed algorithm was evaluated in two groups: the main group, which included 46 patients with vaginal HE, 36 women with abdominal HE, and a comparison group (44 patients with vaginal HE and 34 women with abdominal HE). The data are presented in Table 3.

As can be seen from the demonstrated data, the frequency of vulvovaginal atrophy doubled 3 years after hysterectomy with a progressive increase over time. The most common clinical symptoms were dryness, itching, burning sensation, recurrent vaginal discharge, and contact bloody discharge. At the same time, after 5 years, there was an increase in frequency and severity of symptoms (the main group – 29–35.37% vs. 38–48.71% in the comparison group) These data were statistically significant more often in the group where the proposed algorithm was not used, which indirectly indicates a decrease in steroid-synthetic ovarian function after hysterectomy and effective preventive use of estrogen monotherapy in the rehabilitation program. The processes of atrophic vaginitis and the development of atrophic cystourethritis, as a rule, go hand in hand and cause urinary incontinence. It should be noted that in the preoperative phase 22 patients (13.75%) had the symptoms of urinary incontinence, mostly caused by stress – 20 (12.50%), and was combined with pollakiuria (10–6.25%) and nocturia (11–6.86%). Besides, all these patients underwent plastic surgery of the vaginal walls including pelvic floor muscles during hysterectomy. The investigation during the postoperative period proved that the most severe manifestations were in patients 5 years after surgery, mostly in women with abdominal access, which further confirms the effect of

progressive decline in ovarian hormone production after hysterectomy with opportunistic salpingectomy.

Table 3

Dynamics of parameters of genitourinary manifestations in the examined groups of patients, abs. num., %

Parameter	Original data	6 weeks after HE	12 months after HE		36 months after HE		5 years after HE	
			Main group, p=82	Comparison group, p=78	Main group, p=82	Comparison group, p=78	Main group, p=82	Comparison group, p=78
Frequency of vulvovaginal atrophy	12 – 7.50	14 – 8.75	17 – 20.73	18 – 23.08	22 – 26.83	31 – 39.74*	29 – 35.37*	38 – 48.71*
Dysbiosis	18 – 11.25	29 – 18.13	13 – 15.85 ⁰	27 – 34.61	17 – 20.73	51 – 65.38*	19 – 23.17 ⁰	50 – 64.10*
Cysturethritis	7 – 4.36	7 – 4.36	7 – 8.53	9 – 10.96	18 – 21.95	24 – 30.77	22 – 26.82	30 – 38.46
Pollakiuria	10 – 6.25%	1 – 0.66	5 – 6.10	7 – 8.97	17 – 20.73	25 – 32.05	18 – 21.95	28 – 35.90*
Night pollakiuria	11 – 6.86%	2 – 1.25	7 – 8.53	9 – 10.96	18 – 21.95	26 – 33.33*	20 – 24.39	29 – 37.18*
Incomplete emptying of the bladder	19 – 11.88 %	2 – 1.25	13 – 15.85	12 – 15.38	16 – 19.51	27 – 34.61	19 – 23.17	30 – 38.46*
Stress urinary incontinence	20 – 13.75	4 – 2.50	5 – 6.10	4 – 5.13	18 – 21.95	24 – 30.77*	21 – 25.61 ⁰	32 – 41.02*
Imperative urinary incontinence	12 – 7.50	2 – 1.25	3 – 3.65	3 – 3.85	14 – 17.07	22 – 28.21	16 – 19.51 ⁰	28 – 35.90
Descent of vaginal walls	29 – 18.13	1 – 0.66	3 – 3.65	4 – 5.13	10 – 12.20 ⁰	22 – 28.21	11 – 13.41	20 – 24.39
Cystocele	12 – 7.50	1 – 0.66	5 – 6.10	3 – 3.85	8 – 9.75	18 – 23.08	10 – 12.20	18 – 23.08
Foreign body sensation	20 – 13.75	4 – 2.50	7 – 8.53	12 – 15.38	14 – 17.07	24 – 30.77*	12 – 14.63 ⁰	28 – 35.90*

Notes:

1. * – the difference is statistically significant against the original data, p<0.05;
2. ⁰ – the difference is statistically significant against the data of the comparison group, p<0.05

The most common complaints were night pollakiuria, incomplete emptying of the bladder, stress urinary incontinence. At the same time, according to cystometry, almost a third of patients in the comparison group showed an increase in residual urine by 32%, the

maximum cystometric capacity of the bladder was reduced by 1.5 times, the volume of the bladder at the first urge and in case of uncontrollable urge was decreased by 2.0 times and 1.7 times, respectively, and detrusor pressure at the first and maximum contraction increased by 1.9 and 1.4 times, compared with the main group ($p < 0.05$).

Summary assessment of bacteriological research showed that one third of patients in the comparison group had bacterial vaginosis one year after hysterectomy. Up to 3 years, the main symptoms were pathological secretions; almost every second patient in the comparison group complained of dryness and itching (51 – 65.38%, $p < 0.05$). These changes often led to dyspareunia (28 – 35.90%) and vulvodinia (22 – 28.21%, $p < 0.05$). During postoperative monitoring, normocenosis was diagnosed in the vast majority of patients of the main group. The data were confirmed by determining the vaginal pH (Fig. 1); its obvious increase, especially in women after vaginal hysterectomy, showed a correlation with the data of bacteriological examination of urogenital smears and vaginoscopy rates.

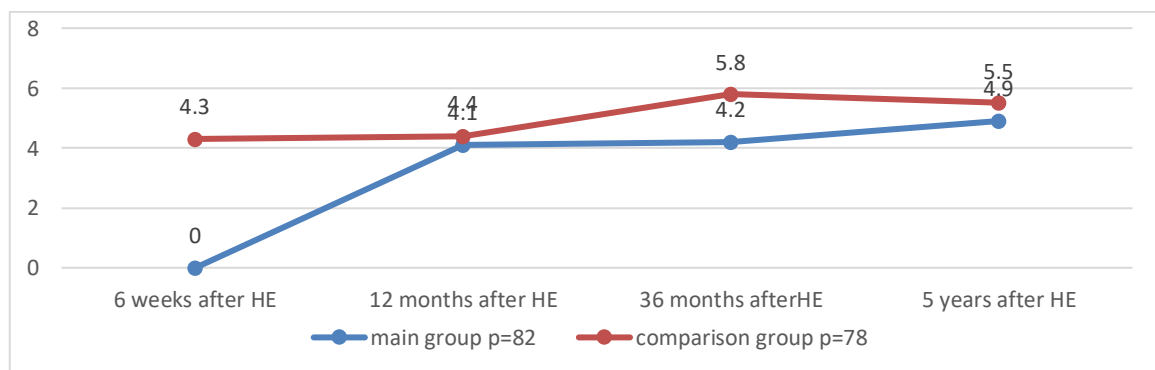


Fig. 1 Vaginal pH in the dynamics of the postoperative period

Study of the severity of genital prolapse revealed the descent of vaginal walls of the first degree with the formation of cystocele in 7 women (5.00%) one year after hysterectomy, in 32 women (5.00%) – 3 years after HE, and twice as often in the comparison group, which confirms the existing opinion in the literature about the important role of hypoestrogenism due to hysterectomy with opportunistic salpingectomy in the progression of pelvic floor failure. On the other hand, a significant proportion of indirect signs of UCTD was revealed at the preoperative stage in women of the studied groups; they are: types of extragenital pathology related to indirect markers of UCTD (mitral valve prolapse, hernia of various localization, myopia, varicose veins of lower extremities, etc.) – 44 cases (27.50%).

The signs of pelvic floor descent was positively correlated with the share of indirect signs of UCTD ($r = 0.42$, $p = 0.05$). Besides, against the background of the proposed algorithm of the rehabilitation program there was a decrease in such psychoemotional and vascular

disorders as fatigue, cephalgia, irritability and improved sleep, which demonstrates the beneficial effect of the proposed therapy against treatment data, while the comparison group continued to increase these parameters.

Thus, the results of studies show that hysterectomy with opportunistic salpingectomy in women of reproductive age, even with preservation of ovarian tissue, is a significant risk factor for the development of neuroendocrine and metabolic disorders, and it also causes an increase in the proportion of genitourinary symptoms, pelvic floor failure and changes in the microbiota of the mucous membrane of the urogenital tract. The severity of genitourinary disorders directly depends on the surgical volume, the age at which surgery was performed and, accordingly, the degree of hypoestrogenism.

Optimization of diagnostic algorithm, modification of operative techniques, development of preventive and rehabilitation measures eliminate or at least reduces the risk of development and progression of genitourinary disorders after surgical treatment of uterine fibroids, thus positively affecting the quality of life of women.

Conclusions

Complex of genitourinary manifestations after radical operations for uterine fibroids in women of reproductive age is a polyetiological multifactorial condition. It is a result of an unspecified and unidentified diagnosis during preoperative examination. The expected effect of surgical recovery may be insufficient, and clinical symptoms of genitourinary syndrome can be manifested in the postoperative period, which requires the development of clear algorithms for diagnosing urinary incontinence and pelvic floor failure in the preoperative stage and the use of long-term preventive measures after hysterectomy in the remote postoperative period. There is no statistically significant difference in the development of genitourinary syndrome in case of applying different surgical approaches.

The use of the proposed therapy improved the clinical and laboratory parameters of the urogenital tract – reducing the frequency of vulvovaginal atrophy by 13%, normalizing the biocenosis and the vaginal pH, reducing the clinical manifestations of such urinary disorders as pollakiuria and nocturnal urinary incontinence by 16%, vaginal prolapse – by 11%, compared to the group with standard postoperative management.

Prospects for further research

When choosing a method and access in case of surgical treatment for uterine fibroids, it is advisable to take into account pelvic prolapse and initial dysuric manifestations in women, obstetric and gynecological pathology and previous pelvic surgery, age and constitution of the patient, her awareness of possible complications, the surgeon's experience

and his choice of surgical techniques. Prospects for further research are further improvement of the rehabilitation program with the use of collagen drugs, local use of cholecalciferol drugs and therapeutic options for the use of platelet-enriched plasma.

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