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EFFECT OF HYSTERECTOMY WITH OPPORTUNISTIC SALPINGECTOMY FOR UTERINE FIBROIDS ON THE DEVELOPMENT OF METABOLIC SYNDROME AND WAYS OF ITS REDUCTION

The aim of the study – to determine the effect of hysterectomy with opportunistic salpingectomy for uterine fibroids on the manifestation and progression of metabolic syndrome and to develop ways of reducing the identified changes.

Materials and Methods. A comprehensive clinical and laboratory evaluation of the influence of hysterectomy with opportunistic salpingectomy for uterine fibroids on the development of metabolic syndrome was performed in the Gynecological Department of Municipal Non-Profit Enterprise "Kyiv Perinatal Center". 160 women were included in the study: 90 patients underwent vaginal hysterectomy including fallopian tubes (both classical and associated with laparoscopy), and 70 women underwent abdominal hysterectomy including fallopian tubes.

Results and Discussion. The development and progression of hypoestrogenemia after hysterectomy with opportunistic salpingectomy contributes to the loss of cardioprotective effects of estrogen, accompanied by psychoemotional and vegetative-vascular dystonia in the early postoperative period of mild and moderate degree, mostly in women under 45 years (30.63 % and 71.86 %, respectively), while metabolic and endocrine abnormalities are practically absent. At the same time, 12 months after surgery, 56.9 % of patients undergo gradual formation of the main components of the metabolic syndrome – hyperglycemia, insulin resistance, dyslipidemia, increasing parameters of atherogenic lipid fractions, increased BMI and vegetative dystonia of the hypertensive type.

Conclusions. The use of metabolic therapy in the remote postoperative period allowed to control blood pressure and improve the clinical and laboratory parameters, namely reducing the level of atherogenicity index by 1.3 times ($p < 0.05$), glycated hemoglobin, OGTT, HOMA index – by 0.8 times against baseline before treatment, which was accompanied by improvement of psycho-emotional and vegetative-vascular manifestations.

Key words: hysterectomy; opportunistic salpingectomy; metabolic syndrome; rehabilitation program.

ВПЛИВ ГІСТЕРЕКТОМІЇ З ОПОРТУНІСТИЧНОЮ САЛЬПІНГЕКТОМІЄЮ З ПРИВОДУ МІОМИ МАТКИ НА РОЗВИТОК МЕТАБОЛІЧНОГО СИНДРОМУ Й ШЛЯХИ ЙОГО НІВЕЛЮВАННЯ

Мета дослідження – встановити вплив гістеректомії із опортуністичною сальпінгектомією з приводу міоми матки на маніфестацію і прогресування метаболічного синдрому й шляхи його нівелювання.

Матеріали та методи. У гінекологічному відділенні КНП «Перинатальний центр міста Києва» проведено комплексну клінічну і лабораторну оцінку впливу гістеректомії з опортуністичною сальпінгектомією з приводу міоми матки на розвиток метаболічного синдрому в 160 жінок, серед них 90 пацієнток, яким було виконано вагінальну гістеректомію з трубами, як класичну, так і асоційовану із лапароскопією, та 70 пацієнток, яким було виконано абдомінальну гістеректомію з трубами.

Результати дослідження та їх обговорення. Втрата кардіопротективного впливу естрогенів після гістеректомії з опортуністичною сальпінгектомією сприяє психоемоційним і вегето-судинним порушенням легкого та середнього ступенів у ранньому післяопераційному періоді переважно у жінок до 45 років у 30,63 і 71,86 %, тоді як обмінно-ендокринних відхилень майже не відмічали. Водночас через 12 місяців після оперативного лікування у 56,9 % пацієнток спостережено поетапне формування основних компонентів метаболічного синдрому: маніфестують гіперглікемія, інсулінорезистентність, дисліпідемія, зростають фракції атерогенних ліпідів, підвищується ІМТ із вегето-судинною дистонією за гіпертонічним типом.

Висновок. Використання метаболізуючої терапії у віддаленому післяопераційному періоді дозволило контролювати рівень АТ та покращити картину клініко-лабораторних параметрів, а саме знизити рівень індексу атерогенності в 1,3 раза ($p < 0,05$), глікованого гемоглобіну, ПТТГ, індексу НОМА в 0,8 раза проти даних до лікування, а також нівелювати картину психоемоційних та вегето-судинних проявів.

Ключові слова: гістеректомія; опортуністична сальпінгектомія; метаболічний синдром; реабілітаційна програма.

ВЛИЯНИЕ ГИСТЕРЭКТОМИИ С ОПОРТУНИСТИЧЕСКОЙ САЛЬПИНГЭКТОМИЕЙ ПО ПОВОДУ МИОМЫ МАТКИ НА РАЗВИТИЕ МЕТАБОЛИЧЕСКОГО СИНДРОМА И ПУТИ ЕГО НИВЕЛИРОВАНИЯ

Цель исследования – установить влияние гистерэктомии с опортуністической сальпингэктомией по поводу миомы матки на манифестацию и прогрессирование метаболіческого синдрома и пути его нивелирования.

Материалы и методы. В гинекологическом отделении КНП «Перинатальный центр города Киева» проведена комплексная клиническая и лабораторная оценка влияния гистерэктомии с опортуністической сальпингэктомией по поводу миомы матки на развитие метаболіческого синдрома у 160 женщин, среди них 90 пациенток, у которых была выполнена вагинальная гистерэктомия с трубами, как классическая, так и ассоциированная с лапароскопией, и 70 пациенток, у которых была выполнена абдоминальная гистерэктомия с трубами.

Результаты исследования и их обсуждение. Потеря кардіопротективного воздействия эстрогенов после гистерэктомии с опортуністической сальпингэктомией способствует психоемоциональным и вегето-сосудистым нарушениям легкой и средней степени в раннем послеоперационном периоде преимущественно у женщин до 45 лет в 30,63 и 71,86 %, в то время как обменно-ендокринные нарушения не проявлялись. В то же время через 12 месяцев после оперативного

лечения у 56,9 % пациенток наблюдается поэтапное формирование основных компонентов метаболического синдрома: манифестируют гипергликемия, инсулинорезистентность, дислипидемия, рост фракций атерогенных липидов, повышается ИМТ с вегето-сосудистой дистонией по гипертоническому типу.

Выводы. Использование метаболизирующей терапии в отдаленном послеоперационном периоде позволило контролировать уровень АД и улучшить картину клинко-лабораторных параметров, а именно снизить уровень индекса атерогенности в 1,3 раза ($p < 0,05$), гликированного гемоглобина, ПТТГ, индекса НОМА в 0,8 раза по сравнению с данными до лечения, а также нивелировать картину психоэмоциональных и вегето-сосудистых проявлений.

Ключевые слова: гистерэктомия; оппортунистическая сальпингэктомия; метаболический синдром; реабилитационная программа.

TOPICALITY. According to the International Diabetes Federation (IDF), one in four deaths between the age of 35 and 64 in countries with a high incidence of diabetes, such as Ukraine, is caused by this disorder or its complications [1]. At the same time, the frequency of hysterectomy for uterine fibroids remains consistently high in this age group. Despite the fact that this surgical treatment of uterine fibroids is considered a safe and effective procedure, there is no denying the growing share of adverse effects, including violation of vegetative-hormonal homeostasis and the risk of progression of a number of diseases of extragenital organs and systems [2]. It should be noted that the viewpoint concerning the pathogenesis of vegetative-neurotic and metabolic disorders due to hysterectomy remains contradictory, when the main pathogenetic mechanism of psycho-autonomic disorders are psychological factors, such as feeling of inferiority, defeminisation, etc., or hormonal imbalance of hemodynamic and blood supply to the pelvic organs, especially ovarian tissue, and, as a consequence, decreased production of steroid hormones. A progressive loss of hormonal activity leads to an imbalance of the lipid spectrum, carbohydrate metabolism, which, in turn, also increases the risk of cardiovascular disease [3–5]. According to the recommendations of IDF, the criteria for revealing the “metabolic syndrome” are the following: central obesity: BMI > 30 kg/m², waist circumference in women is more than 80 cm; plus two more of the following risk factors: blood pressure above 140/90 mmHg; low cholesterol content of high density lipoproteins (HDL cholesterol < 1.0 mmol/l or antilipidemic therapy); elevated triglycerides (above 1.7 mmol/l); microalbuminuria (urine albumin content 30 mg/dL or the ratio of albumin to creatinine 30 mg/g); insulin resistance (using the HOMA index, which normally does not exceed 2.7; fasting venous blood glucose above 6.1 mmol/l or impaired glucose tolerance with glycemia above 11.1 mmol/l 2 hours after glucose loading). Its development is one of the most alarming consequences of reduced estrogen production by the ovaries which have cardio- and angioprotective properties [6–9]. Given that the average age of the onset of menopause is about 50 years and life expectancy for women is about 75 years, this means that most women suffer from estrogen deficiency almost a third of their life and are often afflicted by its effects [10–11]. And in the case of hysterectomy with opportunistic salpingectomy, this state of metabolic homeostasis may occur earlier. Thus, according to the study of Dutch and British researchers published in August 2019 in the Cochrane Library, it was found that the maximum difference in time before menopause, calculated from the lower limit of 95 % CI and natural mean decrease in AMH, was approximately 20 months [12]. It is known that menopause is an independent

predictor of metabolic syndrome [13]. During menopause, the distribution of adipose tissue changes from peripheral type to central type and tissue sensitivity to insulin reduces due to estrogen deficiency [14–16]. In this case, the use of hormone replacement therapy does not lead to weight gain and redistribution of adipose tissue. However, obesity is considered to be an independent and important risk factor for coronary heart disease, type 2 diabetes and other disorders. It is also noted that the risk factor for the development of metabolic syndrome in women are depressive states which frequently are inherent to patients after radical surgery for uterine fibroids [17–19].

Therefore, despite the extensive practical experience of use of the most common gynecological surgery in recent decades – hysterectomy, it should be considered not only from the standpoint of recovery of uterine fibroids, but we should also take into account overall health and changes in quality of life of such patients in the postoperative period, which proves currently insufficient assessment and relevance of the study of this problem for modern research.

THE AIM OF THE STUDY – to establish the effect of hysterectomy with opportunistic salpingectomy for uterine fibroids on the manifestation and progression of metabolic syndrome and to develop ways of reducing the identified changes.

MATERIALS AND METHODS. During the research in the gynecological department of Municipal Non-Profit Enterprise “Kyiv Perinatal Center” a comprehensive clinical and laboratory evaluation of the effect of hysterectomy with opportunistic salpingectomy for uterine fibroids on the development of metabolic syndrome was performed. 160 women were included in the study: 90 patients underwent vaginal hysterectomy including fallopian tubes (both classical and associated with laparoscopy), and 70 women underwent abdominal hysterectomy including fallopian tubes. The control group included 50 women of reproductive age (45.7 ± 1.3) years with asymptomatic fibroids and preserved menstrual function. The main group of surveyed women was divided into two subgroups based on age, when radical surgical rehabilitation was performed: subgroup 1 included patients under 45 years of age 58 (36.3 %), mean age – (43.8 ± 1.6) years; subgroup 2 included women older than 45 years (102–83.7 %), mean age – (47.2 ± 2.1) years. The effectiveness of the proposed algorithm was evaluated in two groups: the main group had a program of preventive measures and included 46 patients with vaginal HE and 36 women with abdominal HE; the comparison group (44 patients with vaginal HE and 34 women with abdominal HE), the postoperative monitoring of which 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 if there are no contraindications (no changes in mammography, abnormalities in Doppler scanning of the vessels of the lower extremities according to the lipid panel results), combined with diet; statins (depending on lipid panel results after 12 months of hormone replacement therapy) 5-10 mg per day; inhibitors of sodium-dependent cotransporter of glucose type 2 (NSGC-2) are recommended to patients with cardiovascular risk, prediabetes and hypertension; to patients with HOMA index above 2.5; to women with fasting venous blood glucose above 6.1 mmol/l or impaired glucose tolerance with glucose higher than 11.1 mmol/l 2 hours after glucose loading – a hypoglycemic drug of the biguanide class as monotherapy depending on BMI values from 500 mg to 1000 mg daily – perorally with individual dose adjustment every 30 days; for the prevention of osteoporosis – vitamin D 4000 regardless of the season.

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, patient's consent to participate in the study. Exclusion criteria were severe symptomatic hypertension, cerebrovascular disorders, type I diabetes mellitus, thyroid disease and other severe somatic diseases leading to the patient's premorbid state before surgery.

Clinical and laboratory evaluation was performed before surgery and in the dynamics after surgery (six weeks, 12 months, 36 months and 5 years after surgery). All women underwent the evaluation of body mass index (BMI), body weight, waist circumference, blood pressure, fasting glucose and glucose level 2 hours after oral glucose tolerance test – OGTT, the level of glycated hemoglobin in the serum, HOMA index, and the values of individual parameters of lipid metabolism: total cholesterol (TC), triglycerides (TG), low-density lipoproteins (LDL cholesterol), atherogenic index (AI). The atherogenic index was calculated by the formula of A.N. Klimov: $AI = TC - LDL \text{ cholesterol} / HDL \text{ cholesterol}$. Assessment of the severity of clinical manifestations was performed using the Kupperman menopausal index. Body mass index (BMI) according to G. Brey was calculated by the formula $BMI = \text{body weight, kg} / (\text{body length, m})^2$. The data obtained were processed using the Statsoft STATISTICA software package. The values of the arithmetic mean (M), its variance and the error of the mean (m) were calculated for all indicators. The statistical significance of the difference

in values between the independent quantitative values was determined using the Mann-Whitney test.

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 from 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. The research is based on ethical standards in accordance with the Helsinki Declaration of the World Medical Association.

RESULTS AND DISCUSSION. The analysis of medical documentation revealed the following: among the extragenital forms at the preoperative stage were hypertension (39–24.4 %), chronic anemia (91–56.87 %) and diseases of the gastrointestinal tract (51–31.86 %), thyroid dysfunction was noted in almost every fifth case. Other nosological forms of genital and extragenital pathology were almost equal in the main and control groups.

It should be noted that six weeks after surgery, the number of ovarian dysfunctions was found in more than half of the observations (99–61.9 %), which was clinically manifested mainly by psychoemotional and vegetative-vascular disorders of mild and moderate degree mostly in subgroup I, whereas metabolic and endocrine abnormalities were practically absent. Thus, complaints of rapid fatigue, mood lability, emotionality, depression were noted in 34 patients under 45 years of age (58.62 %) and in 15 women (14.71 %) after 45 years of age. Such manifestations as sweating, dyssomnia, vestibulopathy, "hot flashes" were recorded in 41 patients (70.68 %) in subgroup I and in 74 women (72.55 %). A number of authors associate such changes with the exclusion of afferent impulses from the endometrium and impaired interreception of the vaginal vaults due to removal of the uterus as one of the important parts of the endocrine system [18]. In addition, in our study, hysterectomy was performed with opportunistic salpingectomy which further impaired the blood supply to ovarian tissue.

At the same time, the comparison of the average values of the body mass index during the early rehabilitation period in the main groups against preoperative values and the data of the control group did not show statistically significant deviations (Table 2).

One of the criteria for metabolic syndrome is overweight and obesity, primarily due to increased waist circumference. It

Table 1. Features of somatic anamnesis in the studied cohort of patients, abs.num.,%

Features of somatic anamnesis	Women's study groups					
	I p=58		II p=102		Control group, p=50	
	Abs.	%	Abs.	%	Abs.	%
Cardiovascular diseases	20	34.48	34	33.33	11	22.00
Gastrointestinal diseases	22	37.93	29	28.43	9	18.00
Obesity	18	31.03*	41	40.19*	7	14.00
Chronic iron deficiency anemia	32	55.17*	59	57.84*	5	10.00
Thyroid dysfunction	12	23.07	19	18.62	4	8.00

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

Table 2. Estimation of anthropometric parameters in postoperative monitoring

Parameters	Subgroup I, p=58		Subgroup II, p=102		Control group, p=50
	Before surgery	After 45 days	Before surgery	After 45 days	
BMI	30.64 ± 2.14	29.14 ± 2.22	32.12 ± 1.56*	31.44 ± 2.26*	27.76 ± 1.62
Waist circumference, cm	78.9 ± 1.9	82.9 ± 2.3	86.1 ± 1.6*	89.9 ± 1.9*	79.9 ± 2.3
Body mass, kg	77.1 ± 1.3	79.4 ± 1.7	81.5 ± 1.9*	80.4 ± 1.8	76.1 ± 1.9

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

should be noted that 29 patients (18.1%) were already obese and had a violation of metabolic homeostasis before surgery. Overweight and obesity are associated with carbohydrate imbalance and dyslipidemia, which initiates the development of insulin resistance, diabetes mellitus, and concomitant somatic pathology, increasing cardiovascular risk; this leads to an indirect assessment of changes (Table 3), which are influenced by changes in the hormonal status of operated patients and the choice of rehabilitation therapeutic options.

Given the data obtained, one of the drugs of choice, which reduces cardiovascular risk, was the use of estradiol in combination with a hypolipidemic diet six weeks after hysterectomy. And after 12 months, if necessary, statins are recommended taking into account the lipid profile of 5–10 mg per day. Patients at high risk of cardiovascular disease, prediabetes, and vegetative-vascular dystonia of the hypertensive type should take the inhibitors of the sodium-dependent glucose cotransporter type 2 (NCCT-2) in order to improve glycemic control and reduce the risk of cardiovascular disease, especially as a prevention of heart failure.

In order to correct impaired carbohydrate metabolism – reduction of insulin resistance – patients with HOMA index above 2.5; fasting venous blood glucose above 6.1 mmol/l or impaired glucose tolerance with glucose higher than 11.1

mmol/l 2 hours after glucose loading – hypoglycemic drug of the biguanide class as monotherapy taking into account BMI values from 500 mg to 1000 mg per day orally with individual dose adjustment every 30 days.

The dynamics of postoperative monitoring showed a tendency to violation of carbohydrate metabolism parameters: averages in groups of levels of glycated hemoglobin, fasting and postprandial glucose, as well as HOMA index after 12 months were significantly higher than baseline and progressively increased to the 5th year of follow-up (Table 3). Thus, impaired glucose tolerance was found in 55 patients (34.38 %), which was manifested by an increase in postprandial serum glucose levels with a slight increase in fasting glucose in combination with high HOMA and glycated hemoglobin. This justified the administration of biguanides to these patients, and in the case of combination with high BMI, vegetavascular dystonia of the hypertensive type NZKTG2 is recommended.

As a result of studies, it was found that hysterectomy after 12 and up to 36 months after surgery was accompanied by doubling in the concentration of triglycerides in both groups against the source data (p<0.05), total cholesterol and LDL cholesterol increased 1.5 times (p<0.05), which is apparently a consequence of decreased estrogen levels and inhibition

Table 3. Dynamics of parameters of carbohydrate and lipid metabolism in the examined groups of patients

Indicators	Output 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
Glycated hemoglobin (HbA1,%)	4.84 ± 1.06	4.97 ± 1.49	5.78 ± 1.26	5.98 ± 0.92	5.24 ± 1.32	5.84 ± 0.96	5.14 ± 1.14	5.94 ± 1.46
Fasting glucose, mmol/l	5.2 ± 1.8	5.8 ± 1.2	5.1 ± 1.8	5.2 ± 0.7	4.8 ± 0.9	5.7 ± 0.4	5.1 ± 0.6	6.1 ± 0.8
Glucose 2 hours after OGTT, mmol/l	6.5 ± 1.5	7.2 ± 1.8	7.9 ± 0.9	8.5 ± 1.8	6.7 ± 1.8	7.8 ± 1.5	6.5 ± 1.1	8.1 ± 1.58
HOMA-IR	2.2 ± 0.6	2.1 ± 1.1	2.7 ± 0.8	2.4 ± 0.2	2.1 ± 1.1	2.9 ± 1.1*	2.3 ± 1.1	2.7 ± 0.4
Total cholesterol, mmol/l	4.21 ± 1.51	3.94 ± 1.19	4.96 ± 1.51	6.16 ± 1.19	4.04 ± 1.62°	7.92 ± 1.92*	3.24 ± 0.69°	6.86 ± 2.32*
Triglycerides, mmol/l	1.42 ± 0.14	0.98 ± 0.14	1.52 ± 0.14	1.72 ± 0.34	1.56 ± 0.75	2.12 ± 0.19	1.48 ± 0.18	1.92 ± 1.04
LDL cholesterol, mmol/l	2.21 ± 1.51	2.94 ± 1.59	3.06 ± 1.12	3.96 ± 1.09	1.59 ± 1.62°	3.92 ± 1.12	2.24 ± 1.69°	4.06 ± 0.32*
AI, com. un.	2.44 ± 1.1	2.1 ± 0.2	3.04 ± 1.3	4.07 ± 2.4	2.44 ± 1.3 2°	4.87 ± 2.4*	2.84 ± 1.3	3.17 ± 2.4

Notes: * – the difference is statistically significant against the original data, p<0.05; ° – the difference is statistically significant against the data of the comparison group, p<0.05.

of estrogen receptors- α , responsible for adipose tissue distribution and glucose metabolism after hysterectomy with opportunistic salpingectomy [16].

12 months after surgery, even on the background of estradiol, which reduces the level of "bad" triglycerides in combination with hypolipidemic diet, the average levels of TG and TC were within the reference range, and their values were (1.52 ± 0.14) mol/l and (4.96 ± 1.51) mmol/l, respectively, but in 19 observations of the main group (23.17 %) there was dyslipidemia with the need for statins. In the comparison group, up to 36 months after surgery, the proportion of deviations in the parameters of the lipid profile increased to the average level of LDL cholesterol (3.92 ± 1.12) mmol/l, and the atherogenic factor was (4.87 ± 2.4) com. un.

Thus, 12 months after surgery, comparing clinical symptoms and laboratory methods in 49 cases (30.63 %), a combination of hypertension, high body mass index, insulin

resistance and dyslipidemia was noted, which indicates the formation of metabolic syndrome and substantiates the feasibility of using the proposed therapeutic options.

The use of metabolic therapy in the remote postoperative period allowed to control blood pressure and improve clinical and laboratory parameters which led to a decrease in atherogenicity index by 1.3 times ($p < 0.05$); glycated hemoglobin, OGTT, HOMA index dropped by 0.8 times against the data before treatment, while in the comparison group these parameters had a tendency to increase.

In addition, against the background of the proposed algorithm of the rehabilitation program there was a decrease in the severity of psycho-emotional and vegetative-vascular manifestations – fatigue, cephalgia, irritability and women's sleep has improved, which demonstrates the beneficial effects of the proposed therapeutic program (Table 4).

Table 4. Dynamics of clinical manifestations of posthysterectomy syndrome, abs. num., %

Research group	Not expressed	Mild degree	Moderate degree	Severe degree
Psycho-emotional disorders on the 45 th day after surgery				
group, p=160	111 – 69.38	17 – 10.63	32 – 20.00	0
Neurovegetative disorders on the 45 th day after surgery				
group, p=160	45 – 28.13	82 – 51.25	31 – 19.38	2 – 1.25
Psycho-emotional disorders 12 months after surgery				
main group, p=82	59 – 71.95	9 – 10.97	14 – 17.07	0
comparison group, p=78	57 – 73.08	9 – 11.54	12 – 15.38 *	0
Neurovegetative disorders 12 months after surgery				
main group, p=82	37 – 45.12 * ^o	30 – 36.58*	15 – 18.28	0
comparison group, p=78	31 – 39.74 *	30 – 38.46 *	17 – 21.79	0
Psycho-emotional disorders 36 months after surgery				
main group, p=82	68 – 82.93 *	9 – 10.97	5 – 6.10 *	0
comparison group, p=78	62 – 79.48 *	9 – 11.54	6 – 7.69 *	1 – 1.28
Neurovegetative disorders 36 months after surgery				
main group, p=82	77 – 93.90* ^o	3 – 3.65 * ^o	2 – 2.43 ^o	0
comparison group, p=78	31 – 39.74 *	30 – 38.46 *	17 – 21.79	0
Psycho-emotional disorders 5 years after surgery				
main group, p=82	71 – 86.59	7 – 9.54	4 – 4.87 ^o	0
comparison group, p=78	64 – 82.05	8 – 10.25	5 – 6.41	1 – 1.28
Neurovegetative disorders 5 years after surgery				
main group, p=82	75 – 91.46* ^o	5 – 6.09 * ^o	2 – 2.43* ^o	0
comparison group, p=78	31 – 39.74 *	30 – 38.46 *	17 – 21.79	0

Notes: * – the difference is statistically significant against the data of the early preoperative period, $p < 0.05$; 2. ^o – the difference is statistically significant against the data of the comparison group, $p < 0.05$.

CONCLUSIONS. Loss of cardioprotective effects of estrogen due to impaired steroidogenesis after hysterectomy with opportunistic salpingectomy contributes to the development of psychoemotional and vegetative-vascular manifestations of mild and moderate degree in the early postoperative period. Such manifestations have more severe impact on women under 45 years (in 30.63 % and 71.83 %,

respectively), whereas metabolic and endocrine abnormalities were practically absent in the early postoperative period. At the same time, 12 months after surgery, 56.9% of patients showed a gradual formation of the main components of the metabolic syndrome – hyperglycemia, insulin resistance, dyslipidemia, increased atherogenic lipid fractions with increased BMI, vegetative-vascular dystonia of the hypertensive type.

The use of metabolic therapy in the remote postoperative period allowed to control blood pressure and improve the clinical and laboratory parameters, namely reducing the level of atherogenicity index by 1.3 times ($p < 0.05$), the level of glycated hemoglobin, OGTT, HOMA index – by 0.8 times against the data before treatment, as well as to improve psycho-emotional and vascular manifestations.

PROSPECTS FOR FURTHER RESEARCH. According to the results of the study, it is important to monitor patients

in the postoperative period in order to correct the symptoms of posthysterectomy syndrome and prevent severe metabolic disorders. In recent decades, the so-called “metabolic direction” has been intensively developing in medicine, which considers the pathogenetic aspects of metabolic disorders at various levels as the basis and leading factor in the progression of many somatic diseases, which preserves the prospect of further research.

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