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HYSTERECTOMY WITH OPPORTUNISTIC SALPINGECTOMY DURING THE MENOPAUSAL TRANSITION AS A PREDICTOR OF CLIMACTERIC DISORDERS

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Abstract

Data on ovarian dysfunction after hysterectomy are found in literary sources, but the nature of changes in the hormonal profile, its chronological sequence, the issue of prognosis and possible preventive measures, even in the case of preservation of ovarian tissue, remain contradictory and fragmentary, which prompted the conduct of this research. **The aim of the research** is to assess the risk of menopausal disorders after hysterectomy with opportunistic salpingectomy during the menopausal transition. **Research materials and methods**.A comprehensive assessment of the long-term consequences of hysterectomy in 160 women of reproductive age was carried out. Risk factors were identified during a general clinical examination, based on anamnestic data. Indicators were evaluated in the examined women. Inclusion criteria: age of menopause transition, hysterectomy due to benign uterine pathology,

patient's consent to participate in the study. **Research results.** The data obtained by us after 12 months from the moment of surgical intervention demonstrate neurovegetative and psychoemotional manifestations in 87 patients - 46.25%. Conclusions. 12 months after GE with opportunistic salpingectomy, 46.25% of patients have a gradual formation of components of the menopausal syndrome. age older than 45, hysterectomy, hormonal therapy of benign uterine pathology demonstrate a connection with the development of metabolic disorders in the distant postoperative period, and their combined effect increases the risk of their development.

Keywords: uterine myoma; climacteric syndrome; hysterectomy; risk factors; hormone therapy.

Topicality. Despite the priorities of organ-preserving surgical interventions in the treatment of these processes, the majority of foreign and domestic literary sources demonstrate the opinion that hysterectomy (GE) with opportunistic salpingectomy is the method of choice for women during the menopausal transition. This frequency of GE causes scientific interest and requires the development of certain practical guidelines for the prevention of a number of somatic diseases that may develop in the distant postoperative period [1-2]. In research over the past decade, among practitioners and scientists, the dominant opinion is that GE adversely affects many aspects of a woman's life and her physical and mental health, the development of early menopause in the reproductive age, an increase in the share of metabolic and endocrine changes, and also increases the risk of cardiovascular - vascular diseases [3-6]. Moreover, changes in endocrine parameters, metabolic regulation, coagulation markers, and psychological status of patients after GE with preserved ovarian tissue are registered. The pathogenetic mechanism of the development of these risks after GE is ambiguous. The traditional hypothesis of possible mechanisms of disruption of ovarian blood flow from ovarian ligaments in GE, which can lead to premature ovarian failure, remains traditional [7]. After GE, a decrease in blood flow in the ovaries and a low level of sex steroids in the ovaries were noted [8-9]. However, there are studies that have shown unchanged ovarian function after GE with opportunistic salpingectomy [10-11]. The long-term consequences of hysterectomy continue to be the subject of scientific debate and controversy. The terms of appearance and severity of symptoms are quite individual, depend on the premorbid background, the volume of surgical intervention and occur in a certain chronological sequence, forming three sets of disorders: early symptoms, intermediate and late. The first group should include metabolic and endocrine manifestations, vegetative-

vascular disorders and psychological disorders. In the future, the next symptom complex is formed - genitourinary disorders. In a more distant chronological period, manifestations of deeper and irreversible processes are observed - osteoporosis and pathology of the circulatory system with the development and progression of somatic diseases [12-17]. The issues of forecasting and subsequent individual rehabilitation of women after GE are not completely clear and structured. The nature of changes in the hormonal and metabolic profile, its chronological sequence, and the issue of the relationship with the development of early menopause remain controversially and fragmentarily covered, which served as the impetus for conducting this study.

The aim of the research - assessment of the risk of the development of climacteric syndrome after hysterectomy during the menopausal transition.

Research materials and methods. On the basis of the gynecological department of the Municipal Non-Profit Enterprise "Kyiv Perinatal Center" in the period from 2015 to 2021 a comprehensive assessment of the long-term consequences of surgical treatment of uterine fibroids in 160 women after GE due to benign uterine pathology was performed, of which 90 patients underwent vaginal hysterectomy with opportunistic salpingectomy, and 70 patients who underwent abdominal hysterectomy with opportunistic salpingectomy. The control group was formed at the expense of 50 women with asymptomatic fibroids and preserved menstrual function. The main indication for surgical treatment was a uterine fibroid. Risk factors were identified during a general clinical examination, based on anamnestic data. The diagnostic program included the assessment of hormonal homeostasis, development of questionnaires to assess the severity of the climacteric syndrome using the modified menopausal index, which were carried out at all stages of postoperative monitoring and rehabilitation within 12 months after surgery. The functional state of the hypothalamic-pituitary-ovarian system was evaluated before and after the surgical intervention by the FSH level in the blood serum. Inclusion criteria: age of menopause transition, hysterectomy due to benign uterine pathology, patient's consent to participate in the study. Exclusion criteria: severe somatic diseases, refusal of patients to participate in the study. Statistical analysis was performed in R statistical programming (r-project.org, ver. 4.0). Univariate chi-square analysis. Multivariate analysis - binary logistic regression with odds ratio calculation. The results were considered statistically significant at $p < 0.05$. The study was conducted in accordance with the Helsinki Declaration of the World Medical Association, agreed with the commission on bioethical expertise and research ethics of the Bogomolets National Medical University Protocol No. 140 dated 12/21/2020

Obtained results and their discussion

The analysis of the medical documentation made it possible to note the following points at the preoperative stage: abnormal uterine bleeding in 90 patients (56.25%) with chronic anemia (91 - 56.86%), chronic pelvic pain (52 - 32.5%), among gynecological diseases in the anamnesis are dominated by inflammatory processes of appendages (58 – 36.25%) and ovarian cysts (52 – 32.5%), benign processes of the cervix (66 – 41.25%) and genital endometriosis (30 – 18.75%) . Other nosological forms of genital and extragenital pathology were in almost equal proportions in the main and control groups. The analysis of the medical documentation made it possible to identify the following risk factors that determined indications for surgical treatment: premenopausal age, reproductive function, complicated course of fibroids, abnormal uterine bleeding resistant to therapeutic measures,

The data obtained by us after 12 months from the moment of surgical intervention demonstrate neurovegetative and psychoemotional manifestations in 87 patients - 46.25%. Among the complaints, the patient noted a transient increase in blood pressure, cephalgia, palpitations, dyssomnia, paresthesias of the extremities, and dry skin. Psychoemotional disorders were manifested by emotional lability, irritability, fatigue, reduced work capacity, memory impairment, decreased and loss of libido. Depressive disorders during the first year after surgery were noted by 44 (27.5%) patients of both groups. What was reflected in connection with laboratory changes: increased levels of FSH on the eve of surgery in 28 women of the I group - 31.11% and 31 of the II group - 37.14% compared to the control of 11 women - 22.0%, while the average level was 13.26±8.12 IU/ml, which in 1,±2.12) IU/ml), by 12 months of the postoperative period there was a tendency to increase the level of FSH by 2.2 times, ($p<0.05$) - 19.62±1.24 in the 1st group, 20.18±1.42 in the II group, while statistically significant changes were determined in 34 women of the I group - 37.78% and 39 of the II group - 55.71%, and only 41 patients (25.6%) noted the approximation of the indicated indicators to the reference values .

Potential risk factors for the development of menopausal disorders, revealed during a general clinical examination, collection of anamnestic data 1 year after GE: smoking - 27 - 16.88% in the main group, against 8 - 16.00% in the control group, hypodynamia - 89 - 55, 63% in the main group, against 26 - 52.00% in the control group, high BMI - overweight and obesity in the main group in 59 women - 36.86%, against 7 - 31.67% in the control group, waist size above 80 cm - 62 - 38.75% in the main group, against 17 - 34.00% in the control group, hormonal therapy of benign uterine pathology, including COC intake – 68 - 42.50% in the main group, against 8 – 16.00% in the control group, age – all women were at the age of

menopause transition, older than 45 years at the time of surgery, there were 102 women in the main group (63.75 %), and in the control group – 32 (64.00%), hysterectomy, family history of early menopause - 14 - 8.75% in the main group, against 6 - 12.00% in the control group. Based on multivariate analysis using binary logistic regression (tab. 1), the following factors were found to be statistically significant: age over 45, hysterectomy, hormonal therapy for benign uterine pathology.

Table 1. Risk factors of climacteric disorders in female patients of the studied groups, n=210.

	Regression coefficient	Error	Statistical significance	Odds ratio
Age older than 45 years	0.543	0.328	0.040	1,721
Hormonal therapy of benign uterine pathology	0.336	0.338	0.000	1,400
Hysterectomy	0.759	0.379	0.030	2,135
Constant	-0.400	0.386	0.000	0.670

Accordingly, for these factors, according to the calculation of the significance of the odds ratio, a calculator was created that allows you to calculate the risk of menopausal disorders, (Fig. 1).

The statistically significant data we obtained confirm that age over 45, hysterectomy, hormonal therapy for benign uterine pathology are collectively associated with the risk of menopausal disorders. Taking into account the obtained data, one of the pathogenetic directions of the rehabilitation program after GE in the risk group may be the use of menopausal hormone therapy already at the appearance of the first minimal climacteric symptoms.

Conclusions. 12 months after GE with opportunistic salpingectomy, 46.25% of patients have a gradual formation of components of the menopausal syndrome. Age older than 45, hysterectomy, hormonal therapy for benign uterine pathology demonstrate a connection with the development of menopausal disorders in the distant postoperative period, and their combined effect increases the risk of their development. These factors at the preoperative stage can serve as prognostic markers of the menopausal syndrome in the distant postoperative period, and their presence can serve as a rationale for the appointment of menopausal hormone therapy in the presence of minimal climacteric symptoms.

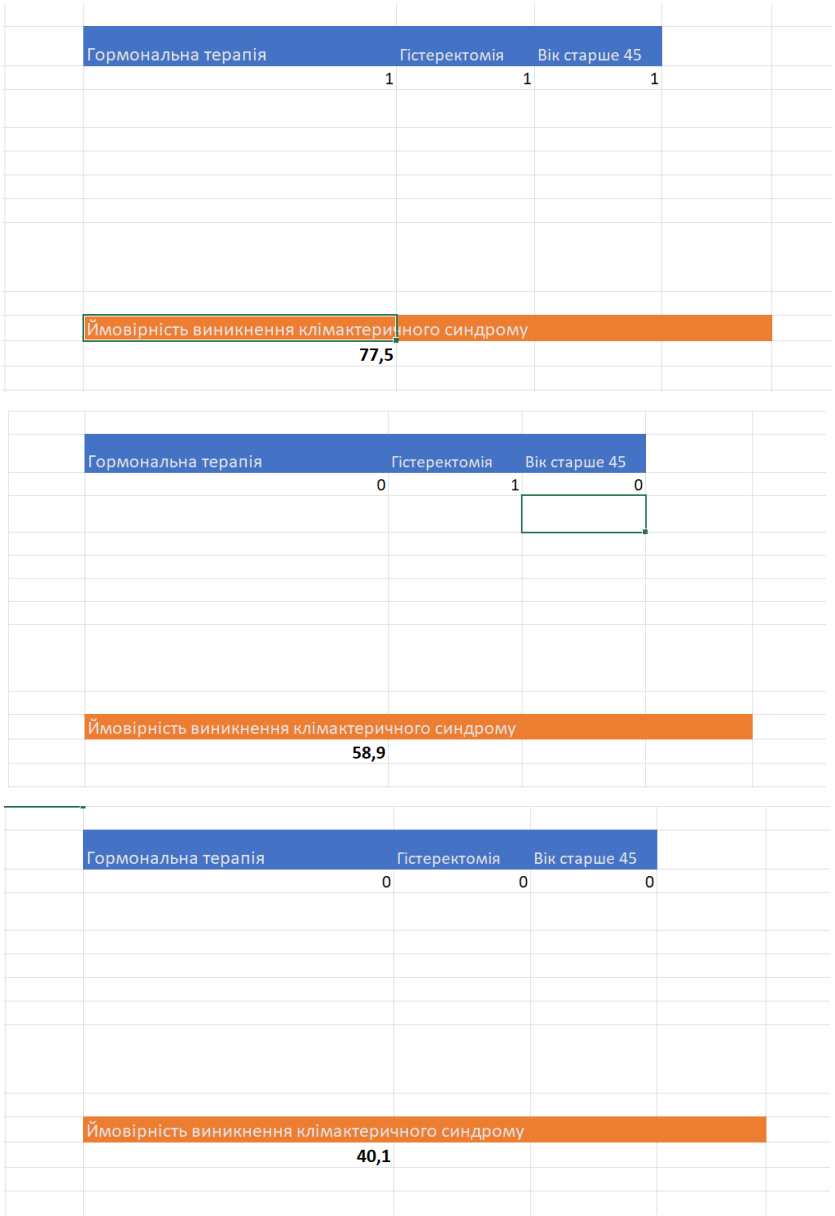

Figure 1. An example of calculating the risk of menopausal disorders based on predictors that showed their statistical significance on the created calculator.

Author Contributions

The authors agree on equal distribution of partial participation.

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Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

All information is publicly available and data regarding this particular patient can be obtained upon request from corresponding senior author.

Conflicts of Interest

The authors declare no conflict of interest.

Acknowledgments

The authors declare that there are no conflicts of interest.

References

1. Misura A. G. Dynamics of metabolic disorders after hysterectomy in the perimenopausal period. // Actual issues of pediatrics, obstetrics and gynecology. - 2014. - No. 2. - P.103-105.

2. Read MD, Edey KA, Hapeshi J. et al. The age of ovarian failure following premenopausal hysterectomy with ovarian conservation // Menopause Int. 2010. V. 16, no. 2. P. 56–59;

3. Nahás EAP, Pontes A., Nahas-Neto J. et al. Effect of Total Abdominal Hysterectomy on Ovarian Blood Supply in Women of Reproductive Age. J. Ultrasound. Med., 2005, vol. 24, pp. 169–174

4. Makris N., Vomvolaki E., Partsinevelos G. et al. The effect of hysterectomy on sexuality and psychological changes. The European Journal of Contraception and Reproductive Health Care March 2006;11(1):23–27;

5. Dronova V.L. Psychological state of patients in the pre- and postoperative periods with gynecological and surgical pathology, methods of its determination (literature review) /V.I.Dronov, R.S.Teslyuk // Perinatology and pediatrics. 2017. - No. 1(69). - P.65-69.

6. Laughlin-Tommaso SK, Khan Z, Weaver AL, et al. Cardiovascular and metabolic morbidity after hysterectomy with ovarian conservation: a cohort study. Menopause 2018;25:483–92.;

7. S Bhattacharya, LJ Middleton, A Tsourapas, AJ Lee, R Champaneria, JP Daniels, T Roberts, NH Hilken, P Barton, R Gray, KS Khan, P Chien, P O'Donovan, KG Cooper; The International Heavy Menstrual Bleeding Individual Patient Data Meta-analysis Collaborative Group. Hysterectomy, endometrial ablation and Mirena® for heavy menstrual bleeding: a systematic review of clinical effectiveness and cost-effectiveness analysis. NIHR Journals Library; 2011 No. 15.19.

8. Hehenkamp WJ, Volkers NA, Broekmans FJ, et al. Loss of ovarian reserve after uterine artery embolization: a randomized comparison with hysterectomy. Hum Reprod. 2007;22(7):1996-2005. doi:10.1093/humrep/dem105

9. Yuan Z, Cao D, Bi X, Yu M, Yang J, Shen K. The effects of hysterectomy with bilateral salpingectomy on ovarian reserve. Int J Gynaecol Obstet. 2019;145(2):233-238. doi:10.1002/ijgo.12798

10. Findley AD, Siedhoff MT, Hobbs KA, et al. Short-term effects of salpingectomy during laparoscopic hysterectomy on ovarian reserve: a pilot randomized controlled trial. Fertil Steril. 2013;100(6):1704-1708. doi:10.1016/j.fertnstert.2013.07.1997

11. Venturella R, Lico D, Borelli M, et al. 3 To 5 years later: long-term effects of prophylactic bilateral salpingectomy on ovarian function. J Minim Invasive Gynecol. 2017;24(1):145-150. doi:10.1016/j.jmig.2016.08.833

12. Vermeulen, CKM, Veen, J., Adang, C. et al. Long-term pelvic floor symptoms and urogenital prolapse after hysterectomy. BMC Women's Health 23, 115 (2023). https://doi.org/10.1186/s12905-023-02286-3

13. Altman D, Falconer C, Cnattingius S, Granath F. Pelvic organ prolapse surgery following hysterectomy on benign indications. Am J Obstet Gynecol. 2008;198(5):572.e1-572.e6.

14. Peculiarities of assessing the quality of life and the search for ways of rehabilitation in women who have undergone surgery on the uterus / G. M. Havrylyuk, O. M. Makarchuk // Halytskyi doszni'nyi visnyk. - 2016. - Volume 23, Number 3(1). - P. 40-43.

15. Mustafa A. Association between hysterectomy and hypertension among Indian middle-aged and older women: a cross-sectional study. BMJ Open. 2023 Apr 20;13(4):e070830. doi: 10.1136/bmjopen-2022-070830. Erratum in: BMJ Open. 2023 Jun 19;13(6):e070830corr1. PMID: 37080618; PMCID: PMC10124308.

16. Matsuo K, Mandelbaum RS, Nusbaum DJ, Matsuzaki S, Klar M, Roman LD, Wright JD. National trends and outcomes of morbidly obese women who underwent inpatient hysterectomy for benign gynecological disease in the USA. Acta Obstet Gynecol Scand. 2021 Mar;100(3):459-470

17. Corrigan KE, Vargas MV, Robinson HN, Gu A, Wei C, Tyan P, Singh N, Tappy EE, Moawad GN. Impact of Diabetes Mellitus on Postoperative Complications Following Laparoscopic Hysterectomy for Benign Indications. Gynecol Obstet Invest. 2019;84(6):583-590. doi: 10.1159/000501034. Epub 2019 Jun 18. PMID: 31212286.