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MODERN DIFFERENTIATED APPROACHES TO THE APPOINTMENT OF MENOPAUSAL HORMONAL THERAPY IN WOMEN WITH METABOLIC DISORDERS IN MENOPAUSE

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Abstract: In recent years, hormonal therapy has become increasingly important for women's health at various age periods and in various clinical situations. The period of menopause causes changes in the production of estrogen by the ovaries, which can lead to the appearance of vasomotor symptoms, and also, overtime, to symptoms of vaginal atrophy, metabolic disorders, osteoporosis. Hormone replacement therapy drugs have become increasingly popular in medical practice, and their effectiveness in the prevention of menopausal disorders has been widely demonstrated. Inaddition, it has been shown that menopausal hormonal therapy improves cognitive function and memory, and accelerates the development of cognitive impairments in women.

Keywords: metabolic disorders, menopausal hormonal therapy, risk factors, dyslipidemia, hypertension.

The age of 40–45 years for women is, unfortunately, associated with an increase in the number of diseases such as obesity, type 2 diabetes mellitus, arterial

hypertension, and atherosclerosis, which leads to a reduction in the life expectancy of these patients [1, p. 771-779].

The most important aspect is the relationship between type 2 diabetes mellitus and the formation of abdominal obesity, dyslipidemia and impaired carbohydrate metabolism. One of the links in the pathogenesis of obesity is a slowdown in basal metabolism, which is aggravated by a deficiency of sex hormones. Thus, a decrease in basal metabolism in postmenopausal women contributes to weight gain of 3-4 kg per year [2, p. 4-6].

It is now known that estrogens control the metabolism of fats and carbohydrates in the body. Estrogens accelerate the breakdown of fats and suppress the synthesis of lipid fractions, which contribute to the development of atherosclerosis. A gradual decrease in estrogen levels during perimenopause leads to lipid metabolism disorders, as well as the development of insulin resistance. Almost all metabolic disorders that occur after menopause are interrelated and further aggravate the adverse effects of sex hormone deficiency on the cardiovascular system. This is especially true for insulin resistance, which is combined with abdominal obesity.

In women with metabolic disorders, disorders of a vegetative-vascular nature predominate in the structure of manifestations of menopausal syndrome in 90% of cases. Emotional and mental manifestations are caused by the underlying disease, hyperandrogenism associated with the effect of hyperinsulinemia on the liver's production of sex hormone-binding globulin, as well as increased production of androgens in the ovaries [3, p. 544-554, 4, p. 393-397].

Estrogen deficiency in menopause also plays a role in changes in glucose and insulin metabolism: insulin concentration increases, insulin resistance and central obesity develop. Insulin secretion and elimination, insulin sensitivity in peripheral tissues decreases. Insulin stimulates the accumulation of lipids, the proliferation of smooth muscle fibers of the arterial wall, and increases the antifibrinolytic activity of the blood. Insulin resistance in postmenopause also plays a major role in the formation of a "vicious circle" in the development of cardiovascular diseases. As the

incidence of type II diabetes increases in postmenopause, insulin resistance can cause atherogenic changes in the vascular endothelium, which in turn can lead to hypertension and changes in vascular elasticity [5, p. 201-206]. It has been established that during menopause in the blood plasma the levels of total cholesterol, LDL cholesterol, total TG, HDL3, VLDL, apolipoproteins (apo-B, apo-CIII, apo-E), lipoproteins B, B/CIII, B/E and the content of total HDL cholesterol and HDL2 decreases [2, p. 4-7, 6, p. 265-270, 7, p. 237-248]. This occurs partly as a result of the loss of the protective effect of estrogens, which explains the need for the use of menopausal hormonal therapy (MHT) to prevent the onset of dyslipidemia and obesity.

Elevated androgen levels, excess abdominal fat, hypertension and increased catecholamines due to insulin resistance are risk factors for cardiovascular disease in menopause [5, p. 201-206].

Thus, all women should be examined by a gynecologist to identify risk factors for the development of coronary artery disease, including an unfavorable family history, dyslipidemia, hypertension and smoking; additional negative effects are exerted by obesity, diabetes, physical inactivity and stress.

One of the pathogenetic approaches to the treatment of women with metabolic disorders in menopause is hormone replacement therapy. Considering the pathophysiology of metabolic disorders, the use of MHT is of great clinical importance, having a positive effect on the course of the underlying disease: estrogens reduce the activity of hepatic lipase, HDL clearance (which manifests itself in an increase in HDL2 levels) and at the same time enhance the synthesis of apo-AI, the synthesis and expression of hepatic receptors for LDL-C, conversion of LDL-C to VLDL-C [2, p. 4-8, 6, p. 265-270, 7, p. 237-248]. A number of studies provide data on a decrease in the waist/hip ratio in menopausal women receiving MHT [7, p. 237-248, 8, p. 242-255, 9, p. 69-77]. Losing body weight during MHT is largely due to the effect on metabolic processes in adipose tissue, but the use of behavioral methods of treating the underlying disease is of paramount importance for this category of patients. For women with lipid metabolism disorders, a low-calorie

diet and regular physical activity are recommended.

Of course, modern hormone replacement therapy is the method of choice in the correction and prevention of manifestations of sex steroid deficiency and its complications in women. But, like any method, it has their advantages and disadvantages, knowledge of which, as well as an individual approach to working with each patient, necessary for the correct prescription and monitoring of hormonal correction, guarantee its effectiveness and safety. Taking into account the individuality of the body, the main problem when prescribing hormone replacement therapy remains the choice of the most optimal hormonal drug in terms of composition, dosage, pharmacokinetics and pharmacodynamics in each specific case to ensure the most pronounced clinical effect with maximum safety. In this case, both beneficial effects are noted due to a decrease in the level of fibrinogen, homocysteine, low-density lipoprotein, increased activity of the fibrinolysis system, and unfavorable effects manifested in a decrease in the concentration of anticoagulant proteins (antithrombin III, protein C and S, tissue factor pathway inhibitor TFPI), the development resistance to activated protein C, increasing the concentration of thrombophilia markers [2, p. 6-8, 10, p.74].

The cause of complications when using MHT may be the presence of a genetic predisposition that is not clinically manifested, but causes increased sensitivity to proinflammatory and prothrombotic stimuli. In this case, taking hormones can become critical in relation to the development of thrombosis [5, p. 201-206, 10, p. 73-77]. The main predisposing factors include genetic thrombophilias, polymorphism of estrogen receptor genes, as well as polymorphism of proinflammatory cytokine genes that influence the development of venous thrombosis.

The question is constantly raised about the essential role that the gynecologist can play: actively participating in the primary prevention of cardiovascular diseases and staying up to date with current recommendations regarding the control of blood pressure, dyslipidemia and other metabolic parameters. Key evidence-based practice implications on this issue are presented in the Hormone Therapy Position of the

North American Menopause Society [1, p. 768-772].

The unreasonably low frequency of MHT use is associated with women's fears, as well as mistrust of doctors and medications. In this regard, it is especially important to conduct detailed counseling regarding the benefits of MHT, side effects, and assessment of the benefit/risk ratio. Counseling can improve the acceptability of MHT and increase the duration of use.

It should be taken into account that in women with lipid metabolism disorders, when prescribing menopausal hormonal therapy, the risk of developing breast cancer, cardiovascular diseases and venous thromboembolism should be assessed. The choice of drug for MHT should be determined by metabolic neutrality, absence of androgenic effect, clear antiproliferative gestagenic effect, maximum similarity to endogenous steroid derivatives.The lowest effective dose of estrogen should be used. The circulation of lupus antibodies and hypertension increase the procoagulant potential of the blood. Many postmenopausal women already have any of the listed risk factors and therefore, before prescribing MHT, you need to evaluate the pros and cons. It should also be remembered that for older women using MHT, the risk of thrombotic complications is 10 times higher than for younger women using OCs. Thus, when prescribing MHT, we must consider additional factors that may increase the risk in older women and avoid the use of MHT in women with a family history of thrombosis or hypertension. The fact that the incidence of thrombosis with hormonal contraception and MHT is higher during the first year of drug use indicates the existence of a predisposition to the development of thrombotic complications, primarily associated with the presence of latent genetic (FV Leiden mutation, prothrombin G20210A mutation, etc.) or acquired thrombophilia caused by antiphospholipid syndrome [11, p. 593-599, 12, p. 305-311].

For hormone replacement therapy, transdermal use of estrogens in combination with micronized progesterone, a progesterone derivative, is preferred. It is known that when used transdermally, estrogens directly enter the bloodstream of the subcutaneous tissue and are distributed in the body before metabolism in the liver occurs. Thus, glucose tolerance is not impaired and weight gain does not occur. It is

known that biologically available estrogen has a cardioprotective effect through carbohydrate and lipid metabolism, and the hemostasis system. The effect is achieved both by influencing risk factors for cardiovascular diseases and by improving endothelial function. Regarding the effect of estrogens on the blood lipid spectrum, it was found that oral estrogen has a greater effect on reducing total and LDL cholesterol levels and increasing HDL cholesterol levels, compared with transdermal estrogen [13, p. 9-23, 14, p. 4-9]. However, oral estrogen is associated with an increase in serum triglyceride levels, leading to a supraphysiological increase in estrone levels, which can lead to metabolic and enzymatic changes in the liver [3, p. 544-554, 9, p. 69-71, 15, p. 162-170, 16, p. 999-1009]. Unlike oral forms, therapeutic doses of transdermal estrogens do not increase estrone, triglyceride, or angiotensinogen levels or decrease antithrombin III levels.For women with risk factors for obesity or carbohydrate metabolism disorders, the choice of a progestogen component is also very important. Derivatives of 19-nortestosterone affect liver function due to residual androgenic activity, which with long-term use is manifested by an increase in AST and ALT [15, p. 162-170, 17, p. 88-94, 18, p. 257-271]. They also reduce the beneficial effects of estrogen on HDL cholesterol levels. It is preferable to use progesterone preparations with metabolic neutrality and maximum similarity to endogenous steroid derivatives.Thus, the use of hormone replacement therapy in menopausal women is advisable in order to correct and prevent manifestations of sex steroid deficiency and its complications. In the presence of age-related changes in hemostasis parameters and properties of the vascular wall, a certain premorbid background, which initially causes the development of endothelial dysfunction and increased readiness for blood clotting, taking hormonal drugs may be a trigger for the development of thrombotic complications.

Avoiding the negative effects of MHT is possible only with a comprehensive assessment of risk factors. In addition to conducting standard screening studies (mammography, ultrasound of the pelvic organs, hemostasiogram, etc.), before prescribing MHT, one should not neglect a thorough study of both family and personal thrombotic history, as well as obstetric history, since up to 70% of

complicated pregnancies (syndrome) fetal loss, severe gestosis, premature abruption of a normally located placenta) is associated with a violation of the hemostasis system - APS and hereditary thrombophilias. In women of menopausal age, a burdened obstetric and somatic history already indicates a high risk of complications in the case of MHT use.

LITERATURE

1. "The 2022 Hormone Therapy Position Statement of The North American Menopause Society" Advisory Panel. The 2022 hormone therapy position statement of The North American Menopause Society. Menopause 2022; 29:767.

2. Ko S.H., Kim H.S. Menopause-Associated Lipid Metabolic Disorders and Foods Beneficial for Postmenopausal Women. Nutrients. 2020;12:202. doi: 10.3390/nu12010202.

3. Hyvarinen M., Juppi H.K., Taskinen S., Karppinen J.E., Karvinen S., Tammelin T.H., Kovanen V., Aukee P., Kujala U.M., Rantalainen T., et al. Metabolic health, menopause, and physical activity-a 4-year follow-up study. Int. J. Obes. 2022;46:544–554. doi: 10.1038/s41366-021-01022-x

4. Raglan GB, Schulkin J, Juliano LM, Micks EA. Obstetrician-gynecologists' screening and management of depression during perimenopause. Menopause 2020; 27:393

5. Khalfa A., Tiali A., Zemour L., Fatah A., Mekki K. Prevalence of metabolic syndrome and its association with lifestyle and cardiovascular biomarkers among postmenopausal women in western Algeria. Int. J. Gynaecol. Obstet. 2017;138:201–206. doi: 10.1002/ijgo.12206.

6. "The evaluation of lipid profile in patients with metabolic syndrome according to the cardiovascular risk calculated on the basis of SCORE chart." Endokrynol Pol (2016). DOI: 10.5603/EP.a2016.0020

7. Stefanska A., Bergmann K., Sypniewska G. Metabolic Syndrome and Menopause: Pathophysiology, Clinical and Diagnostic Significance. Adv. Clin. Chem. 2015;72:1–75. doi: 10.1016/bs.acc.2015.07.001.

8. Estrogen and progestogen use in postmenopausal women: 2010 position statement of The North American Menopause. – 2010. – Vol. 17 (2). – P. 242-255.

9. Choi D., Choi S., Son J.S., Oh S.W., Park S.M. Impact of Discrepancies in General and Abdominal Obesity on Major Adverse Cardiac Events. J. Am. Heart Assoc. 2019;8:e013471. doi: 10.1161/JAHA.119.013471.

10. Sager, H.B., Linsel-Nitschke, P., Mayer, B., et al."Physicians' perception of guideline-recommended low-density lipoprotein target values: characteristics of misclassified patients." Eur Heart J 10.31 (2010): 1266–73.

11. Bergendal A, Kieler H, Sundström A, et al. Risk of venous thromboembolism associated with local and systemic use of hormone therapy in peri- and postmenopausal women and in relation to type and route of administration. Menopause 2016; 23:593.

12. Masson M., Siniawski D., Krauss J., Cagide A. Clinical applicability of the Framingham 30-Year Risk Score. Usefulness in cardiovascular risk stratification and the diagnosis of carotid atherosclerotic plaqu. Rev EspCardiol 2011; 64: 4: 305—311.

13. Hormone Replacement Therapy. Guidance for Menopause. Based on NHS Stockport CCG HRT Guidance for Menopause Management. January 2023.

14. Physicians' perception of guideline-recommended low-density lipoprotein target values: characteristics of misclassified patients. Eur Heart J 2010; doi:10.1093/eurheartj/ehq026.

15. de Villiers, T.J., Pines, A., Panay, N., et al. "Updated 2013 International Menopause Society recommendations on menopausal hormone therapy and preventive strategies for midlife health." Climacteric 3.16 (2013): 316–37.

16. Christakis M.K., Hasan H., De Souza L.R., Shirreff L. The effect of menopause on metabolic syndrome: Cross-sectional results from the Canadian Longitudinal Study on Aging. Menopause. 2020;27:999–1009. doi: 10.1097/GME.0000000000001575.

17. Hong S.H., Hwang S.Y., Kim J.A., Lee Y.B., Roh E., Kim N.H., Seo J.A., Kim S.G., Kim N.H., Choi K.M., et al. Comparison of anthropometric indices

for the screening of nonalcoholic fatty liver disease in pre- and postmenopausal women. Menopause. 2020;27:88–94. doi: 10.1097/GME.0000000000001419.

18. Oliver-Williams C., Glisic M., Shahzad S., Brown E., Pellegrino Baena C., Chadni M., Chowdhury R., Franco O.H., Muka T. The route of administration, timing, duration and dose of postmenopausal hormone therapy and cardiovascular outcomes in women: A systematic review. Hum. Reprod. Update. 2019;25:257–271. doi: 10.1093/humupd/dmy039.