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MODERN APPROACHES TO THE MANAGEMENT OF METABOLIC SYNDROME IN PERIMENOPAUSAL WOMEN

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Abstract: Metabolic syndrome is one of the leading causes of metabolic and cardiovascular disorders in perimenopausal women and significantly affects their overall health. This study aimed to evaluate the effectiveness of comprehensive correction of metabolic syndrome in women during the perimenopausal period. A total of 77 women with metabolic syndrome underwent clinical, anthropometric, biochemical, hormonal, and instrumental examinations before and after treatment. Comprehensive therapy, including dietary modification, increased physical activity, metformin (Metfogamma), and Inoclim, significantly improved insulin resistance, lipid metabolism, body weight, and menopausal symptoms ($p < 0.05$). Early diagnosis and individualized correction of metabolic disturbances may reduce cardiovascular risk and improve the quality of life of perimenopausal women.

Keywords: metabolic syndrome, perimenopause, women, insulin resistance, obesity, lipid metabolism, carbohydrate metabolism, metformin, quality of life, lifestyle modification.

СОВРЕМЕННЫЕ ПОДХОДЫ К КОРРЕКЦИИ МЕТАБОЛИЧЕСКОГО СИНДРОМА У ЖЕНЩИН В ПЕРИМЕНОПАУЗАЛЬНОМ ПЕРИОДЕ

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Аннотация: Метаболический синдром является одной из ведущих причин метаболических и сердечно-сосудистых нарушений у женщин в перименопаузальном периоде и существенно влияет на состояние их

здоровья. Целью исследования явилась оценка эффективности комплексной коррекции метаболического синдрома у женщин в перименопаузе. В исследование были включены 77 женщин с метаболическим синдромом, которым до и после лечения были проведены клиническое, антропометрическое, биохимическое, гормональное и инструментальное обследования. Комплексная терапия, включавшая коррекцию питания, повышение физической активности, применение метформина (Метфогамма) и Иноклима, способствовала достоверному улучшению показателей инсулинорезистентности, липидного обмена, массы тела и выраженности климактерических симптомов ($p < 0,05$). Своевременная диагностика и индивидуализированная коррекция метаболических нарушений позволяют снизить сердечно-сосудистый риск и улучшить качество жизни женщин в перименопаузальном периоде.

Ключевые слова: метаболический синдром, перименопауза, женщины, инсулинорезистентность, ожирение, липидный обмен, углеводный обмен, метформин, качество жизни, модификация образа жизни.

Introduction: Metabolic syndrome is one of the most prevalent metabolic disorders affecting women during the perimenopausal period and has become a major medical and social challenge worldwide. The prevalence of metabolic syndrome has increased steadily over recent decades because of population aging, sedentary lifestyles, unhealthy dietary habits, and the growing incidence of obesity. During perimenopause, hormonal changes, particularly estrogen deficiency, contribute to the development of abdominal obesity, insulin resistance, dyslipidemia, arterial hypertension, and impaired glucose metabolism. These metabolic abnormalities significantly increase the risk of cardiovascular disease, type 2 diabetes mellitus, non-alcoholic fatty liver disease, and reproductive disorders. In addition to increasing morbidity and mortality, metabolic syndrome negatively influences physical functioning, psychological well-being, and overall quality of life in middle-aged women. Early detection of metabolic disturbances is therefore essential for preventing disease progression and reducing long-term

complications. Current therapeutic strategies include lifestyle modification, dietary intervention, increased physical activity, and pharmacological treatment aimed at improving insulin sensitivity and correcting metabolic abnormalities. Comprehensive management has been shown to improve metabolic parameters, reduce cardiovascular risk, and alleviate menopausal symptoms. However, optimization of treatment approaches for women in the perimenopausal period remains an important clinical issue. Therefore, further investigation of effective methods for the correction of metabolic syndrome is necessary to improve patient outcomes, preserve reproductive and general health, and enhance the quality of life of women during the perimenopausal transition.

Aim of the study: To evaluate the effectiveness of comprehensive correction of metabolic syndrome in perimenopausal women by assessing changes in anthropometric, metabolic, hormonal, and clinical parameters following lifestyle modification and pharmacological therapy.

Materials and methods. A prospective clinical study was conducted at the Department of Internal Medicine of a tertiary healthcare institution in Uzbekistan. The study included 77 perimenopausal women diagnosed with metabolic syndrome according to the International Diabetes Federation (IDF, 2005) criteria. The participants were aged 48–65 years, with a mean age of 52.0 ± 2.6 years. Women with diabetes mellitus, severe cardiovascular diseases, malignant neoplasms, or other serious chronic disorders were excluded from the study. All participants provided written informed consent before enrollment. Clinical assessment included medical history, physical examination, anthropometric measurements, body mass index, waist circumference, and blood pressure evaluation. Laboratory investigations included fasting plasma glucose, glycated hemoglobin, serum insulin, lipid profile, and calculation of the HOMA-IR index. Hormonal assessment included follicle-stimulating hormone, luteinizing hormone, estradiol, progesterone, prolactin, cortisol, and testosterone. All patients received comprehensive treatment consisting of dietary counseling, increased physical activity, metformin therapy, and supportive treatment for menopausal symptoms.

Statistical analysis was performed using IBM SPSS Statistics 26.0. Continuous variables were expressed as mean $\pm$ standard deviation, and differences between baseline and post-treatment values were analyzed using Student's t-test. A p-value < 0.05 was considered statistically significant.

Results. The study demonstrated that perimenopausal women with metabolic syndrome had a high prevalence of metabolic and cardiovascular risk factors. Abdominal obesity was identified in all participants, while insulin resistance, dyslipidemia, hyperglycemia, arterial hypertension, and hepatic steatosis were observed in the majority of patients. Increased body mass index and waist circumference confirmed the predominance of visceral obesity. Hormonal evaluation revealed decreased estradiol levels together with elevated prolactin, testosterone, and cortisol concentrations in a considerable proportion of women, indicating endocrine imbalance during the perimenopausal period.

After six months of comprehensive treatment, significant clinical and metabolic improvements were observed. Body weight stabilized during the first three months, followed by a gradual monthly reduction, while waist circumference decreased, reflecting a reduction in visceral fat accumulation. Biochemical analysis demonstrated significant decreases in fasting glucose, glycated hemoglobin, insulin concentration, HOMA-IR index, total cholesterol, low-density lipoprotein cholesterol, and triglyceride levels, whereas high-density lipoprotein cholesterol increased significantly ($p < 0.05$). More than half of the participants experienced a marked reduction in menopausal vasomotor symptoms, and no serious adverse effects of therapy were reported. These findings indicate that combined lifestyle modification and pharmacological treatment effectively improved metabolic control, endocrine status, and overall clinical condition in perimenopausal women with metabolic syndrome.

Conclusions: Comprehensive management of metabolic syndrome in perimenopausal women significantly improved metabolic, hormonal, and clinical parameters after six months of treatment. Lifestyle modification combined with metformin therapy effectively reduced insulin resistance, improved lipid and

carbohydrate metabolism, and decreased visceral obesity. Timely diagnosis and individualized correction of metabolic disturbances may reduce cardiovascular risk, alleviate menopausal symptoms, and improve the quality of life of perimenopausal women.

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