

UDC 618.173

<https://doi.org/10.33619/2414-2948/41/09>

ARTERIAL HYPERTENSION IN THE POSTMENOPAUSE – CORRELATION PARALLELS

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АРТЕРИАЛЬНАЯ ГИПЕРТЕНЗИЯ В ПОСТМЕНОПАУЗЕ – КОРРЕЛЯЦИОННЫЕ ПАРАЛЛЕЛИ

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Abstract. Arterial hypertension is probably one of the most widespread diseases. According to statistics, the prevalence of AH at the age of 45–54 years among women is 58%, and at the age of 55–64 years it increases to 74.5%. Given the fact that the antihypertensive drugs are provided in the age group of 55–64 years, the order of 80% provides that the effectiveness of the use of drug therapy is only 30%. It is at this age that the postmenopause period occurs. On average, the duration of postmenopausal varies from 5 to 6 years and can last up to 65–69 years. Compared with men of the same age group, cardiovascular diseases are significantly less frequently affected. The presence of cardinal changes in the mechanism of occurrence and course of the pathology of the cardiovascular system in men and women, primarily due to the general differences and cardioprotective effects of ovarian hormones. It has been established that in the period of postmenopause a significant increase in the frequency of arterial hypertension occurs in women. Hypoestrogenism plays a significant role in the formation of arterial hypertension in this cohort of patients, and this affects the endothelium leading to its dysfunction, and its implementation is carried out through the components of the metabolic syndrome. From an analysis of the literature, it can be seen that the effect of hormone replacement therapy should be positive. Nevertheless, it should be noted that the development of arterial hypertension in postmenopause is a complex and multifaceted process.

Аннотация. Артериальная гипертония, пожалуй, одно из самых широко распространенных заболеваний. По статистике распространенность АГ в возрасте 45–54 лет среди женщин 58%, а начиная с возраста 55–64 лет увеличивается до 74,5%. Учитывая тот факт, что именно в возрастной группе 55–64 лет прием антигипертензивных препаратов достигает порядка 80%, эффективность применения медикаментозной терапии достигает

всего лишь 30%. Именно на этот возраст и приходится период постменопаузы. В среднем длительность постменопаузы варьирует от 5 до 6 лет и может продолжаться до 65–69 лет. Доказанным фактом является то, что женщины в пременопаузе, достоверно реже подвержены сердечно–сосудистым заболеваниям в сравнении с мужчинами одинаковой возрастной группы. Наличие кардинальных различий в механизмах возникновения и течения патологии сердечно–сосудистой системы у мужчин и женщин, обусловлены прежде всего гендерными различиями и кардиопротективными эффектами овариальных гормонов. Установлено, что в период постменопаузы происходит достоверное повышение частоты артериальной гипертензии у женщин. Гипоэстрогения играет существенную роль в формировании артериальной гипертензии у данного контингента пациенток, при этом происходит воздействие на эндотелий, ведущие к его дисфункции, а реализация осуществляется через компоненты метаболического синдрома. Из анализа литературных источников видно, что имеет место быть положительный эффект гормонозаместительной терапии. Тем не менее следует отметить, что развитие артериальной гипертензии в постменопаузе сложный и многогранный процесс, зависящий от множества переменных.

Keywords: postmenopause, arterial hypertension.

Ключевые слова: постменопауза, артериальная гипертензия.

Long-term clinical and epidemiological studies of the last few years have revealed heterogeneity in the occurrence of atherosclerotic vascular lesions in people depending on gender [1, p. 240]. In addition to modifiable and non-modifiable risk factors, women have their own unique factor that increases the risk of cardiovascular complications (RCC) — postmenopausal estrogen deficiency [2, p. 1137]. Under the menopause understand the cessation of menstruation, which is caused by a progressive shortage of female sex hormones [3, p. 2378]. It is a proven fact that premenopausal women are significantly less likely to suffer from cardiovascular diseases (CD) compared with men of the same age group [4, p. 227]. A decrease in hormonal activity leads to the formation of lipid spectrum disorders, such as an increase in total cholesterol (cholesterol), low-density lipoprotein (LDL cholesterol) and triglycerides (TG), which undoubtedly affect the increased risk of developing CD [5, p. 672]. In addition to changes in the lipid spectrum during menopause, changes also occur in the vessels: prostacyclin production decreases, endothelin levels increase, and endothelially dependent vasodilation decreases [6, p. 295]. Subsequently, there is an increase in blood pressure (BP) and body weight, there is a redistribution of subcutaneous tissue, a change in insulin sensitivity, as a result of which disturbances occur in glucose metabolism. An increased risk of CD in postmenopausal patients can be associated with an increase in fibrinogen level [7, p. 129]. Many authors agree that surgical menopause is associated with an increased risk of CD [8, p. 949] than natural. According to statistics, CDs are more common among women who have undergone total ovariectomy at an early age than women of similar age with a preserved hormonal status. The increased risk of CD in this group of women can be explained primarily by the compensatory reaction of the tissues to phytoestrogens in the absence of adaptation to the conditions that have arisen [4, p. 225]. According to literary sources, the postovariectomy syndrome, especially the climacteric syndrome, occurs in 65–85% of women [8, p. 949]. The syndrome occurs with the occurrence of both metabolic and endocrine disorders among them and endothelial dysfunction, impaired metabolic processes in bone tissue, etc.

According to a study conducted by A. Maccartur et al. (2015) arterial hypertension (AH), among women of reproductive age who had ovariectomy, was detected in 35.9% of cases [6, p. 300]. In the premenopausal period, hypertension is less common than in men, but subsequently, the

prevalence of hypertension increases and exceeds the level among men of the same age group [6, p. 301]. Still, data on the relationship between menopause and hypertension in women are contradictory and ambiguous. A number of studies clearly demonstrate higher levels of blood pressure in postmenopausal women. The relationship of menopause and hypertension is extremely difficult to establish due to the fact that the menopause period coincides with involutinal changes, and they correlate with body mass index, behavioural factors, and the social level of patients. Menopause is characterized by a progressive deficiency of female sex hormones - estrogen and progesterone, which are important participants in the regulation of vascular tone and blood pressure [4, p. 225]. Estrogens interact with specific receptors of sex hormones located in the vascular wall, which leads to their antiproliferative effect on vascular smooth muscle cells. Estrogens are also characterized by endothelium-dependent / independent vasodilatory effects, improved endothelium functionality, and suppression of calcium transport through calcium channels. Progesterone is involved in the regulation of arteriole tone, and the mechanism of action is similar to calcium antagonists. In addition, it reduces the reabsorption of sodium, i.e., it has essentially anti-mineralocorticoid effect [2, p. 1140]. Today, a number of mechanisms are known that interpret an increase in blood pressure during menopause. Menopause is accompanied by an increase in body mass index and metabolic disorders. The lack of estrogen in postmenopausal disease can upset the balance between vasoactive hormones and the functioning of the cells of the smooth muscle vessels, probably through electrolyte imbalance. In menopause, there is a redistribution of Na^+ in the body, an increase in the level of haemoglobin and red blood cells, which affects blood viscosity, and eventually, it leads to an increase in blood pressure. There is a point of view that hypertension in women in the postmenopausal period is primarily due to an increase in total peripheral vascular resistance (PVR), and determines the rise in blood pressure, as evidenced by the close correlation relationship between these indicators. An increase in blood pressure in postmenopausal women is considered to be a component of metabolic syndrome (MS). To date, a number of mechanisms that constitute the basis of the MS. In physiological terms, pancreatic insulin is released in response to glucose, but there are situations when hyperinsulinemia develops (in this context as a result of insulin resistance) when insulin titer must increase to maintain the physiological level of normoglycemia. A number of lipid enzymes and lipoprotein metabolism are sensitive to insulin, which suggests a violation of lipid metabolism during insulin resistance. For postmenopausal women, a central redistribution of fat is more characteristic in comparison with premenopausal women or those receiving hormone replacement therapy (HRT) [2, p. 1130], which correlates with adverse changes in blood pressure.

HRT applied for a long time (5–7 years), has a corrective effect on menopausal metabolic syndrome [1, p. 243]. The complex effect of using HRT in the postmenopausal period also has a positive effect on the improvement of lipid metabolism, endothelial function, reducing the proliferation of smooth muscle cells, increasing the vasodilation potential, initiating the synthesis and release of NO_2 [1, p. 240]. According to a randomized PEPI study conducted by the United States Institute of Health, it was noted that HRT does not affect blood pressure in postmenopausal women with normotone. Today, the ability of estrogens to have a positive effect on the function and structure of blood vessels is known, and also estrogens are capable of leveling vasoconstriction. It is also worth noting that in the majority of studies that focused on the effectiveness of HRT, women without CD were included, therefore, the effectiveness of HRT in women with hypertension has been studied very little. As noted above, estrogens have a positive effect on the lipid profile and thus have positive effects on the cardiovascular system. When comparing the effects of antihypertensive drugs, it is necessary to focus on the fact that they reduce the positive effects of estrogens on lipids. Thus, there are cardinal differences in the formation and course of

cardiovascular diseases in men and women, due to the presence of individual gender differences and cardioprotection by ovarian hormones in the reproductive period. The fact of increasing the frequency of hypertension in women in the postmenopausal period was reliably established. In the formation of hypertension in this cohort of patients, hypoestrogenism plays a determining role, affecting the components of the metabolic syndrome and endothelial dysfunction. The positive effect of HRT on key indicators of the functional status of cardiovascular disease in patients with the menopausal syndrome in combination with initial circulatory disorders was noted.

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*Работа поступила
в редакцию 15.03.2019 г.*

*Принята к публикации
21.03.2019 г.*

Cite as (APA):

Abramova, S., Selkin, V., Iseev, D., Usov, A., & Grachev, D. (2019). Arterial Hypertension in the Postmenopause - Correlation Parallels. *Bulletin of Science and Practice*, 5(4), 103-107. <https://doi.org/10.33619/2414-2948/41/09>.

Ссылка для цитирования:

Abramova S., Selkin V., Iseev D., Usov A., Grachev D. Arterial Hypertension in the Postmenopause - Correlation Parallels // *Бюллетень науки и практики*. 2019. Т. 5. №4. С. 103-107. <https://doi.org/10.33619/2414-2948/41/09>.