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FEATURES OF ARTERIAL HYPERTENSION AND THE DAILY PROFILE OF BLOOD PRESSURE IN POSTMENOPAUSAL WOMEN

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Abstract

Arterial hypertension is one of the most pressing problems of cardiology. In the development of arterial hypertension, the gender and age of patients are important, in particular, periods of hormonal restructuring of the body. Numerous studies have proven the relationship between the development of arterial hypertension and the onset of menopause in women (8,9). A number of factors contribute to the occurrence and progression of hypertension during this period: changes in hemodynamics due to hormonal shifts, the development of metabolic syndrome, and an increase in the tone of the sympathetic nervous system. Hormonal changes are determined by a significant decrease in the level of estrogens and progesterone against the background of a relative predominance of androgens, increased secretion of gonadotropic (follicle-stimulating, luteinizing) hormones (4). Cardiovascular protective properties of estrogens have been experimentally proven in the female body, estrogen receptors have been found on the surface of cardiomyocytes and vascular smooth muscle cells.Deprivation of the beneficial effects of estrogens on lipid and carbohydrate metabolism, vascular wall, renin-angiotensin and blood clotting systems and, as a result, the development of menopausal metabolic syndrome can be regarded as the cause of an increase in the incidence of hypertension in women in the menopausal period (1,2.). Against the background of a deficiency of sex hormones, so-called menopausal disorders may occur. The most well-known early manifestation of menopausal disorders is **Climacteric Syndrome (CS)** - this is a kind of symptom complex, which is characterized by neuropsychic, vasomotor and metabolic-endocrine disorders that occur against the background of age-related changes that complicate the course of the menopausal period. The development of menopausal syndrome may precede menopause and persist for quite a long time in postmenopause.(5,7) The presence of menopausal syndrome significantly worsens the course of arterial hypertension that occurred in premenopause, and worsens the course of the disease (an increase in the degree of hypertension) in postmenopause.

The Purpose of the Study

To study and determine the severity of menopausal syndrome and changes in the daily profile of blood pressure (BP) in women in the pre- and postmenopausal periods.

Material and Methods

64 women were studied, 42 of whom (average age — 49.4 ± 5.2 years) had grade 1-2 hypertension, and 22 had menopause without hypertension (average age — 48.1 ± 2.6 years). All the examined patients were divided into groups: I (20 women with premenopausal hypertension), II (22 patients with postmenopausal hypertension), III and IV (10 women without premenopausal hypertension and 12 postmenopausal, respectively) For the differential diagnosis of the severity of menopausal syndrome, the Kupperman index (1959) was used, modified by E.V.Uvarova (1983)(7). The severity of each

symptom was assessed in points (0-3), after which the severity of CS was determined by the sum of the points using a modified menopausal index (MMI). According to the indicators of the modified Kupperman-Uvarova menopausal index (MI), there are mild, moderate and severe forms of CS. Table 1.

Table 1. Assessment of the severity of menopausal syndrome according to the modified menopausal index.

Symptoms, scores	Degree of severity		
	Weak	Moderate	Heavy
Neurovegetative	10-20	21-30	>30
Metabolic	1-7	8-14	>14
Psychoemotional	1-7	8-14	>14
MMI	12-34	35-58	> 58

Daily blood pressure monitoring was performed using the CardioTens-01c device in stationary conditions for at least 24 hours. In the period from 7 to 23 o'clock, blood pressure was recorded every 15 minutes, in the period from 23 to 7 o'clock every 30 minutes. Based on the recommendations of the European Society for Arterial Hypertension (ESAH) and the European Society of Cardiology (ESC) in 2003, the criteria for increased average daily SBP and DBP were considered to be: >125/80 mmHg, in the daytime >135/85 mmHg; at night >120/70 mmHg (3).

The indicator of the degree of nocturnal decrease in blood pressure "DND" was calculated using the following formulas separately for SBP and DBP: (average daytime SBP – average night SBP)×100% / average daily SBP;

(average daytime DBP – average nighttime DBP)×100% / average daytime DBP. ×100%. Depending on the DND of SBP, four groups were identified ("dippers" - DND is 10-20%; "non-dippers" - DND <10%; "over-dippers" - DND>20%; "night pickers" - people with nocturnal hypertension).

Statistical data processing was carried out using the statistical package of the SPSS program (v.13.0). The results are presented in the form of M±SD, where M is the average value, SD is the standard deviation. We used standard criteria for assessing intergroup differences – the Student's t-test. The differences were considered significant at $p<0.05$.

Results and Discussion

It was found that CS symptoms were present in 92.6% of women with hypertension and 72.4% without hypertension ($p < 0.05$). It was revealed that women in the premenopausal period had rare - 2-3 times a day - hot flashes, a wave-like feeling of warmth appearing on the face, headaches, increased excitability and mood lability. In women suffering from hypertension in the premenopausal period, the leading manifestations of menopausal syndrome are psychological disorders with vegetative disorders. During the transition to postmenopause, against the background of an age-related decrease in the concentration of sex hormones, increased manifestations of menopausal syndrome with a predominance of metabolic-endocrine, psycho-emotional disorders were observed in group II. (Fig.1) which indicates an aggravation of metabolic disorders with the onset of menopause.

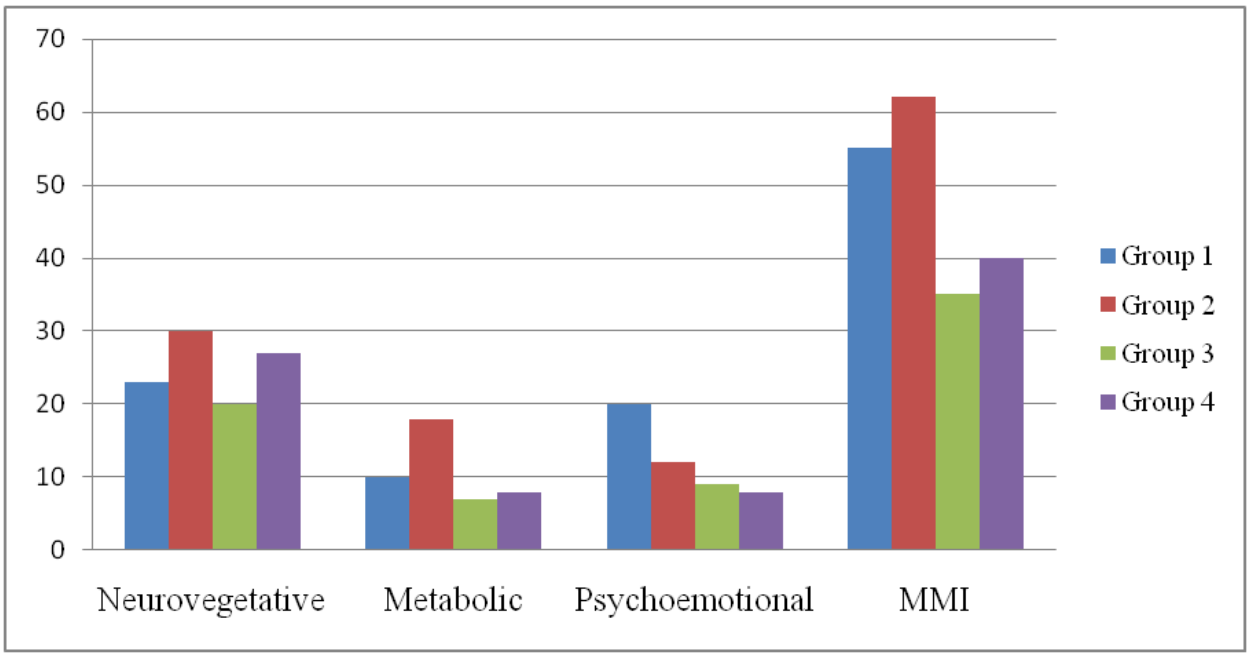

Fig 1. The average score of the modified menopausal index in different groups

In the postmenopausal period, there is an increase in the degree of hypertension, so with daily monitoring in premenopausal hypertension of the 1st degree was detected in 54.5% of women, and the 2nd degree of hypertension was observed in 36.5% of patients, and in postmenopausal the number of women with hypertension of the 2nd degree increased (66.6%), and women with hypertension were also observed 3 degrees (24.6%). The results of daily blood pressure monitoring in women of different groups are presented in table. 2.

Table 2.Types of daily blood pressure profile according to daily blood pressure monitoring in women of different groups in %

Types of blood pressure changes		Women with AH		Women without AH		p
		Group I	Group II	Group III	Group IV	
		Pre menopausal	Post menopausal	Pre menopausal	Post menopausal	
DND in SBP	Dippers	68,2	41,7	87,5	73,5	<0.05
	non-dippers	11,6	39,7	9,4	22	<0.05
	over-dippers	20,2	8,1	3,1	4,5	<0.05
	night-peakers		10,5%			
DND in DBP	Dippers	52,2	30	43,3	32,1	<0.05
	non-dippers	32	53,2	45,5	54,1	<0,05
	over-dippers	3,1	9,1	5,1	5,3	<0,05
	night-peakers	12,7	7,7	6,1	8,5	<0,05

The analysis of 24-hour blood pressure monitoring indicators revealed in women with hypertension in the postmenopausal period (Group II) the predominance of the daily blood pressure profile according to the "non –dipper" type and amounted to 40.7%, and in the premenopausal period, 60.2% of women with hypertension had sufficient DND of blood pressure according to the "dipper" type. Also, 18.5% of women in the postmenopausal period had a nocturnal increase in SBP (night peaker), whereas before menopause, 20.2% of women (I gy) had an excessive decrease in blood pressure during sleep (overdipper). Similar data were obtained in women without hypertension. Thus, despite the normal values of daily SBP, the increase in blood pressure in group IV was statistically significant ($p < 0.05$). The revealed changes can be explained by an increase in the tone of the sympathetic nervous system, which is associated with both the peculiarities of the formation of hypertension and a decrease in the concentration of sex hormones.

After menopause, the number of women with hypertension increased, whose SBP decreased insufficiently at night (from 20% to 40.7%; $p < 0.05$). These changes are most likely associated with the progression of hypertension against the background of hypoestrogenism and simultaneous aggravation of damage to target organs.

Thus, as a result of comparing the severity of the menopausal syndrome and the data from the 24-hour BP monitoring of women with and without hypertension, it allowed us to come to the conclusion that it is necessary to carry out differentiated therapeutic and rehabilitation measures depending on the phase of the menopausal period, which implies the selection of groups and doses of antihypertensive drugs and the correction of neurovegetative and psychoemotional disorders.

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