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Impact on Osteoarthritis on Variability of Good Profile of BP in Patients with Essential Hypertension

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There are 12 million hypertensive patients registered in Ukraine, representing 32.2 % of the adult population. It was experimentally shown that the risk of complications and death depends on the degree of increase in blood pressure and, consequently, the effectiveness of its control. The study included 90 patients of menopausal age in hypertensive patients with osteoarthritis. The clinical course of hypertension is complicated by concomitant OA, manifesting the change of circadian rhythms of daily BP. Obviously, articular syndrome can be considered as stress mechanism of action that is mediated by angiotensin II, and possibly activates α -adrenergic receptors. The results of daily blood pressure monitoring showed that one of the key indicators - the degree of night BP reduction in the examined groups was significantly different. In patients with OA it was 22,8±1,2% lower than in those without OA.

Keyword: Arterial Hypertension, Menopause, Osteoarthritis.

1. Introduction

According to the official statistics of the Ministry of Health on January 1, 2011 there are 12 million hypertensive patients registered in Ukraine, representing 32.2% of the adult population. It was experimentally shown that the risk of complications and death depends on the degree of increase in blood pressure and, consequently, the effectiveness of its control^[1]. Special group of patients with high-kardiometabolic risk is the postmenopausal women^[2, 3]. While studying the circadian blood pressure index it was found out that in women it occurs 2 times more often, especially when compared to SBP, a increased blood pressure is found out, in which the daily index values greater than 20%^[3, 4]. In gender studies the difference of the daily profile of blood pressure found out that men has higher levels of systolic and diastolic blood pressure and indices of stress, while women tend to raise blood pressure variability^[5,6]. Comparison of daily

profile of blood pressure in women with preserved menstrual function and after menopause shows that in patients with postmenopausal circadian blood pressure profile is characterized by significantly higher data of blood pressure variability during the day and higher data of the morning blood pressure. Dynamics of the circadian rhythm in women varies with age - decreases the meaning of the daily index^[6]. This factor is an indirect sign of increased blood pressure at night, which increases the risk of clinical complications. Thus, it is correction of blood pressure variability that plays a special importance in the treatment of women with postmenopausal hypertension^[7]. In recent decades the problem of osteoarthritis acquired special meaning. Generally 10-15% of people aged over 60 have osteoarthritis (OA), and to the aging of the population it becomes an important disease. Although the development of OA ad does not affect life prediction, this

pathology is a major cause of premature disability and disability, as well as the emergence of chronic pain, which significantly reduces the quality of life of patients and complicating other diseases, including hypertension [8, 9, 10].

The aim was to evaluate changes in circadian blood pressure profile in women of postmenopausal age with hypertension combined with concomitant articular pathology.

2. Materials and Methods

The study included 90 patients of menopausal age in hypertensive patients with OA, whose average age is $49 \pm 2,58$ years, with an average body mass index - 28.76 ± 1.04 kg/m², who at the time of surveys were menopausal, of which 6 had surgically induced menopause before the age of 45 years (6.7%), while the rest were in the physiological menopause. Depending on the intensity of pain and duration of lesions, all patients were divided into 3 groups. Clinical characteristics of patients in group I were the following: they were of the second level of AH, osteodefitsyt of the I level with little or no pain articular syndrome. Patients had no bad habits, no history of bone fractures 4- of them had surgically induced menopause and therefore had a clearly seen climacteric syndrome. In the second group were included the patients with hypertension of the second level with mild to moderate severe articular pain syndrome and had no fracture history and signs osteodefisensy. In the third group of patients it was the second level AH, signs of osteoporosis and clearly seen articular pain syndrome.

To achieve the objectives there were made systematic efforts, which included: surveys of patients, research of anthropometric indicators, ambulatory blood pressure monitoring (carried out on the machine AVDM 04 "Meditech" (Hungary). Severity of articular syndrome was assessed by pain scores in the index, pain on palpation by expressing the size of the articular index, joint swelling, which was assessed by the inflammatory index in points.

3. Results and Discussion

It was found out that the accession of OA to hypertension aggravates the hypertension. Activation of inflammation of the joints increases blood pressure, especially in patients of I and III groups, and develops cardiac symptoms. On the other hand, in hypertensive patients with higher levels of blood pressure and with clearer symptoms dominates a little morning stiffness and crepitus of movement in every third woman even without the clearly seen pain. Severity of pain in VAS scores system at the beginning of treatment was for the patient of group I of $2,4 \pm 0,5$ points, for the second group - $7.8 \pm 0,5$ points, for the third group - $8,6 \pm 0,4$ points. Most frequently pain was observed in patients of second and third groups, and thus was in group II - in 70,3% of patients, in the experimental group III is - 80% of patients. The deformation of joints and mobility limitations are most clearly in patients of groups II and III 46.7% and 73.3% respectively. Such criteria of active inflammation, as swelling around the joints and pain at palpation, had often been seen in patients in the third group 46,7% of patients (Fig 1).

Distribution of patients according to the nature of the circadian rhythm of blood pressure in all three groups was respectively: those with normal (10-20%) decrease in blood pressure at night - "dippers" were respectively 44%, 18,6%, 19,3%, patients with low (0-10%) reduction in blood pressure at night "non-dippers" - 34,2%, 59,1%, 58,2%; patients with persistent nocturnal blood pressure increase, which exceeded the daily "night-peakers" - 21,8%, 22,3%, 22,5%. Most clearly in the examined groups was noted the variability in SBP in patients of 2 and 3rd groups, it was significantly higher ($p < 0,05$). Daytime SBP variability in patients with OA was significantly higher ($p < 0,05$), which contributes to the development of cardiovascular complications and increased mortality of patients [1]. It should also be noted the dependent of variability in SBP patients on the severity of pain. In patients with OA,

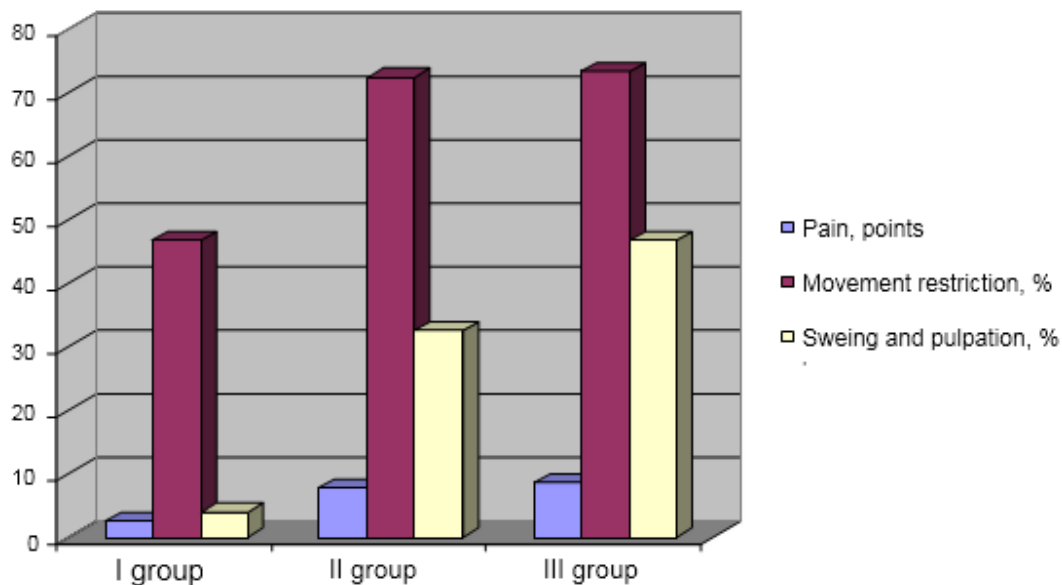


Fig 1: Changes in the joints of patients with hypertension

was significantly higher ($p < 0,05$), which contributes to the development of cardiovascular complications and increased mortality of patients [1]. It should also be noted the dependent of variability in SBP patients on the severity of pain. In patients with OA, the sum of all points of the articular syndrome (pain, joint, inflammation and limitation of movement in the joint) which was more than 8 points, the average daytime SBP variability was $16,6 \pm 0,8$ mm and significantly (p

$<0,01$) higher than the average daily SBP variability ($12,1 \pm 0,5$ mm Hg) in patients with OA of the severity sum score was less than 4 (Fig 2). In determining the degree of correlation between the magnitude of daily SBP variability and total index of pain severity of OA was found the existing significant positive correlation of moderate density ($r = 0,514$; $p < 0,05$) between them.

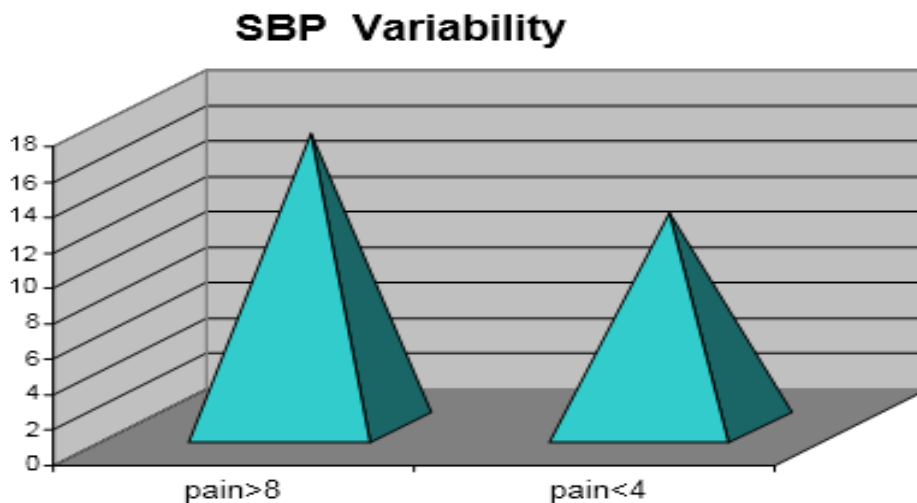


Fig 2: The dependence of the variability of systolic blood pressure on the severity of pain

Increased variability of daily blood pressure in patients with OA can be associated with a decrease in exercise tolerance as a result of the presence of articular syndrome.

4. Conclusions

The clinical course of hypertension is complicated by concomitant OA, manifesting the change of circadian rhythms of daily BP. Obviously, articular syndrome can be considered as stress mechanism of action that is mediated by angiotensin II, and possibly activates α -adrenergic receptors. The results of daily blood pressure monitoring showed that one of the key indicators - the degree of night BP reduction in the examined groups was significantly different. In patients with OA it was $22,8 \pm 1,2\%$ lower than in those without OA.

In the long term study it is expected to study the effect of concomitant OA on the structural and functional parameters of the cardiovascular system and to determine its differential correction algorithm.

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