

# IMPLEMENTATION AND EFFECTIVENESS OF A PREVENTIVE PROGRAM AT THE CLINIC OF A GENERAL PRACTITIONER IN PATIENTS WITH ARTERIAL HYPERTENSION AND CEREBRAL DISORDERS

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**ABSTRACT** — 130 arterial hypertension patients of Stage II with the achieved eutonia who were on the dispensary observation by the general practitioner were studied. Risk factors, clinical signs of cerebral disturbances, rigidity of the vascular were evaluated in all patients. During a year of observation in-depth individual preventive consulting was provided to patients two times. It turned out that active dispensary observation of arterial hypertension patients with implementation in the area of responsibility of the general practitioner of individual consulting allowed not only achieving target values of arterial pressure, improving elastic and tonic properties of the vascular wall, reducing intensity of the endothelial dysfunction but reducing intensity of such modified risk factors as excessive consumption of salt with food, sedentary lifestyle and smoking. The experience shows that to reinforce the educational skills in arterial hypertension patients with cerebral disturbances it's necessary to perform in-depth preventive consulting (no less than 2-3 times per year), which finally increases compliance with performance of medical recommendations.

**KEYWORDS** — arterial hypertension, vascular wall stiffness, risk factors, cerebral disorders.

## INTRODUCTION

In the development and progress of diseases of the circulatory system, risk factors play an important role. Late detection and inadequate correction of these risk factors increases the likelihood of cardiovascular complications [2, 7, 5]. Moreover, vascular lesions of the brain are a complication, usually of uncontrolled arterial hypertension (AH), leading to neurological, psycho-emotional, cognitive impairment, as a result of which patients lose their ability to work and social adaptation [4]. Preventive measures to combat risk factors are crucial in reducing the prevalence of hypertension, as well as increase patient commitment to perform medical appointments in the outpatient unit. Scientific studies [3, 8] showed that one of the main methods

that increase the completeness and accuracy of medical appointments is to educate patients. Based on this, the purpose of this study was to study the effectiveness of in-depth preventive counseling by the general practitioner in patients with arterial hypertension.

## MATERIALS AND METHODS

130 patients (male — 29, female — 101; average age  $58.1 \pm 1.1$  years) of stage II hypertension were examined, who were under observation at a general practitioner and received combined antihypertensive therapy. All hypertensive patients had signs of chronic cerebral blood supply disorders, with the initial manifestations of insufficient blood supply to the brain in 31 people, dyscirculatory encephalopathy (DE) stage I — 56, DE stage II — 43 people. A neurological examination, anthropometry, control of blood pressure and questioning to identify risk factors for cardiovascular diseases were conducted, the lipid spectrum of blood plasma and the level of fasting glucose were determined [6]. All surveyed performed a contour analysis of the pulse wave and a sample with reactive hyperemia (occlusive test) using the photoplethysmographic method [1]. Based on the contour analysis of the pulse wave (apparatus *Angioskan-01*), the following indicators were calculated: biological age of the vascular system (VA, years), stiffness index (SI, m/s), central systolic blood pressure (Spa, mm Hg), augmentation index (Alp 75%), normalized for pulse rate (CP = 75 beats/min), reflection index (RI,%). To assess endothelial dysfunction, a test was performed with reactive hyperemia with determining the occlusion index by amplitude (IRA, cond. Units) and phase shift (SF, ms) between the channels. Within the framework of follow-up, during the year, patients underwent in-depth individual preventive counseling twice (initially and after 6 months). The training program consists of a cycle of structured 2 sessions of 60 minutes duration with a frequency of 2 times a week. The content of each lesson involves the alternation of informative and the active part. The latter is a discussion of the information provided, the calculation of

individual risk factors, training patients with specific health monitoring skills. The classes are aimed at studying the causes, symptoms of high blood pressure and exacerbations of diseases, risk factors for the development of complications of the disease, the basics of self-monitoring of blood pressure, first-aid self-help with increasing blood pressure, the basics of healthy nutrition in hypertension, the role of physical activity and the main groups of antihypertensive drugs used in the treatment of hypertension. After 6 months, the severity of risk factors, the level of blood pressure were assessed, and after 12 months, the severity of cerebral disorders and the dynamics of photoplethysmography indices were assessed.

The normal distribution of the sample was determined by the Kolmogorov-Smirnov criterion. In data processing, the arithmetic average of the standard deviation ( $M \pm SD$ ) was calculated for the quantitative traits. Comparison of the two groups by quantitative scales was carried out on the basis of the non-parametric Mann-Whitney test. The analysis of the dynamics of indicators was carried out on the basis of non-parametric criteria (Wilcoxon, Mac-NeiMar) [9]. The level of statistical significance was recorded at 0.05. Statistical data processing was carried out using the statistical package Statistica 10.

## RESULTS

Before the beginning of in-depth preventive counseling, the level of blood pressure was  $136.6 \pm 1.1 / 82.5 \pm 1.1$  mm Hg. According to the survey, the use of table salt ( $> 5$  g/day) was detected in 36 (27.7%), overweight and obesity (BMI —  $27.1 \pm 0.4$  kg/m<sup>2</sup>) — in 108 (83.1%), tobacco smoking — in 34 (26.1%), alcohol abuse — in 21 (16.1%), low physical activity — in 43 (33.1%), hypercholesterolemia (level of total blood plasma cholesterol —  $6.6 \pm 0.2$  mmol/l) — in 32 (24.6%), diabetes mellitus and impaired glucose tolerance (plasma glucose level —  $7.1 \pm 0.3$  mmol/l) — in 19 (14.6%). When evaluating the clinical signs of cerebral disorders, headache was present in 92 (70.8%), dizziness — in 54 (41.5%), noise and tinnitus — in 68 (52.3%), sleep disturbance — in 81 (62, 3%), increased fatigue — in 72 (55.4%), decreased memory and attention — in 94 (72.3%).

During the contour analysis of the pulse wave there was an increase in RI ( $44.8 \pm 2.0\%$ ), Alp 75 ( $18.6 \pm 1.3\%$ ), Spa ( $137.0 \pm 2.0$  mm Hg), which testified to an increase in the tone of small resistive arteries and stiffness of the arterial wall; The level of the IS was  $8.0 \pm 0.1$  m/s, VA —  $57.1 \pm 1.7$  years. When conducting an occlusive test, a decrease in IRA was recorded -  $1.4 \pm 0.3$  conv. units, SF — minus  $5.7 \pm 0.4$  ms, indicating a pronounced endothelial dysfunction.

Thus, prior to the initiation of in-depth preventive counseling, hypertensive patients with cerebral disorders often detected overweight and obesity, physical inactivity, excessive consumption of salt with food, smoking, hypercholesterolemia, alcohol abuse and hyperglycemia, which were combined with a deterioration of the elasto-tonic vascular properties. walls and severe endothelial dysfunction.

Individual preventive counseling was conducted for all patients and its effectiveness was evaluated twice with a multiplicity between examinations of 6 months. So, after 6 months, in patients with hypertension with cerebral disorders, the level of blood pressure was  $132.4 \pm 1.5 / 81.3 \pm 0.8$  mm Hg. Among risk factors, 6.1% ( $p < 0.05$ ) had a reduction in the use of table salt with food, 5.3% had overweight and obesity (BMI —  $30.8 \pm 0.5$  kg/m<sup>2</sup>), 7.6% — of low physical activity, in 4.6% — hypercholesterolemia (total plasma cholesterol level —  $6.5 \pm 0.1$  mmol/l), in 4.6% — hyperglycemia and impaired glucose tolerance (glucose level blood plasma —  $6.9 \pm 0.3$  mmol/l), in 5.3% there was a refusal to smoke tobacco, in 0.7% — from alcohol, while maintaining signs of cerebral disorders.

After 12 months, in patients with hypertension with cerebral disorders, the level of blood pressure was  $134.1 \pm 1.9 / 82.2 \pm 1.2$  mm Hg. 10.8% ( $p < 0.05$  compared with the initial values) of patients had a reduction in the use of table salt with food, 1.5% — overweight and obesity (BMI —  $30.8 \pm 0.5$  kg/m<sup>2</sup>), 9.2% ( $p < 0.05$  compared with the initial values) were hypo-dynamic, 6.9% ( $p < 0.05$  compared to the initial values) had quit smoking, 0.7% — from alcohol consumption, 5.3% normalized lipid metabolism (blood plasma cholesterol level —  $6.2 \pm 0.1$  mmol/l), and 3.8% - carbohydrate metabolism (blood plasma glucose level —  $7.5 \pm 0, 4$  mmol/l). When assessing clinical recognition Cerebral disorders in 9.2% ( $p < 0.05$  compared with the initial values) of the patients showed a decrease in the severity of headache, in 16.8% ( $p < 0.05$  compared to the initial values) — dizziness, in 20, 4% ( $p < 0.05$  compared with the initial values) — sleep disorders, 2.4% — noise and tinnitus, 2.4% — cognitive disorders (memory and attention).

When conducting a contour analysis of the pulse wave in patients of this group against the background of normal central systolic pressure in the aorta Spa ( $137.3 \pm 2.2$  mm Hg) and the stiffness index SI ( $7.8 \pm 0.1$  m/s;  $p < 0, 05$  compared with the initial values), there was a decrease in RI ( $42.1 \pm 1.8\%$ ), Alp 75 ( $17.6 \pm 1.1\%$ ), VA ( $56.1 \pm 1.4$  years). According to the data of the occlusal test, an increase in the indices of the occlusion index in the amplitude of IRA ( $1.8 \pm 0.2$  conv. Units) and in the SF ( $-6.9 \pm 0.7$  ms) was

recorded, which indicated an improvement in endothelial function.

## DISCUSSION

Prior to the beginning of in-depth preventive counseling of hypertension patients with disorders of cerebral circulation, obesity, excessive consumption of salt with food, smoking, alcohol abuse, hyperglycemia and hypercholesterolemia were often detected, which were combined with the deterioration of the elastotonic properties of the vascular wall manifested in endothelial dysfunction.

Six months after the in-depth preventive counseling in patients with hypertension with cerebral disorders, there was a decrease in the severity of controlled risk factors, such as sedentary lifestyle, increased salt intake, overweight and obesity, and smoking. After a year of follow-up, patients with hypertension with cerebral disorders showed a further decrease in the severity of modifiable risk factors, which was combined with a decrease in the severity of complaints of cerebral character and improvement in the elastotonic properties of the vascular wall and decrease in endothelial dysfunction.

## CONCLUSION

As a result of the introduction of in-depth preventive counseling of hypertensive patients with cerebral disorders at the general practitioner, after 12 months of observation, not only the target blood pressure was achieved, improved elastotonic properties of the vascular wall, reduced severity of endothelial dysfunction, but also reduced manifestation of risk factors, such as excessive use of salt with food, physical inactivity, tobacco smoking was detected. As experience shows, as part of follow-up observation, it is necessary to conduct in-depth preventive counseling more often (at least 2–3 times a year) for hypertensive patients with cerebral disorders, which contributes to increasing their knowledge of the disease and rehabilitation methods, which ultimately leads to the implementation of the prescribed recommendations.

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