

“The impact of hypertension on the body balance regulation” – summary.

In industrialized countries, hypertension refers to nearly half of the adult population, and remains one of the most widespread risk factors of the cardiovascular diseases. It is predicted that this percentage will increase in the next few years, and with it will increase the number of complications of hypertension, including imbalances. Over the past few decades, more and more is talked about the need for more intensive prevention of hypertension, because despite of numerous programs in Poland to combat with hypertension still only a quarter of people with hypertension have well controlled blood pressure. The main priorities now are early detection of hypertension and its intense treatment, because if no treatment in the initial period is often not associated with symptoms, then subsequently develop complications. Duration of exposure to high blood pressure in combination with individual characteristics translates into different image of imbalances.

The correct balance of the human body requires the cooperation of the musculoskeletal system, nerve and organ of balance and continuous supervision by the central nervous system. High blood pressure affects all components of a complex system of balance. The central nervous system controls the vertical position of the body by a slight displacement of the center of gravity within an area of support. This attitude has the correct muscle tension and maintaining physiological curvature of the spine. The correct position of center of gravity is done through the use of appropriate the movement strategies and maintaining balance in case of its loss. The occurrence of hypertension impairs the control system working, which is often not perceived by patients and leads to the appearance of the first losing control symptoms over the body balance which can be found during the test on a stabilometric platform. To evaluate the statistic value of position of the patient's center of pressure we observed the center of pressure movement during standing tests on the stabilometric platform, and the results were recorded by computer. Stable position attitude provide relatively minor changes the center of pressure parameters. The aim of the study was to evaluate the effect of hypertension on body balance control what based on an objective method recording movement of the center of gravity during quiet standing on the stabilometric platform.

Posed the following hypotheses:

- 1) Hypertension worsens control of the body balance.
- 2) Higher blood pressure worse regulation of the body balance.
- 3) Improved control of high blood pressure to the recommended level below 140/90 mmHg is associated with better performance of stabilometric parameters.

The study was based on stabilometric platform CQ Stab2P in two base platform version CQ Elektronik System firm. The total duration of the study consisted of two tests by 30 seconds: one with eyes open, the other with closed, in the same standing position with the upper limbs freely lowered along the body. Control study was performed after three months of home control of the blood pressure with the aim of its good pharmacological treatment between the time of the studies.

Having met the inclusion and exclusion criteria study involved 114 people: 67 women and 47 men aged 43-62 years (mean age 52.1 ± 7 years), with diagnosed hypertension without comorbidities that may affect the body balance. Control group consisted of healthy people aged 42-60 years (mean age 51 ± 5 years), including 60 women and 40 men.

Patients with uncontrolled hypertension in my study often presented worsening balance parameters studied on a stabilometric platform. The higher the blood pressure values were the higher values of balance parameters were achieved during the study on the stabilometric platform. The diagnosis of hypertension, particularly in conjunction with incorrect pharmacological control (mean blood pressure above 140/90 mmHg), have significantly affected on the balance parameters during the test on stabilometric platform. Correction of the blood pressure control after three months resulted in an improvement in the study of the sway path parameter distance traveled in a test with eyes open, and the mean amplitude, the size of the marked area of the residence times of the COP in a circle with a radius of 5 mm and the front margin of safety in the study with closed eyes in these patients. People suffering from hypertension may be more often exposed to dizziness and falls, and consequently should, in addition to improving the pharmacological management of hypertension, be included in the program of prevention of these complications in the future. Uncontrolled hypertension, sensitizing the entire system of balance to its effect, interferes formed on a lifetime pattern of stable posture, which leads to loss of control. Normalization of blood pressure and adequate control of hypertension in the coming years may lead not only to reduction in a cardiovascular risk, but also a smaller number of falls, and thus improving the quality of life and human mobility.

Conclusions:

1. Hypertension, particularly improperly controlled, which values exceed 140/90 mmHg worse body balance control. Patients often don't feel it, but it can be diagnosed during the study on the stabilometric platform, as a result that persons represent higher values of stabilometric

parameters. These people are more often exposed to imbalances complications as dizziness and falls.

2. Detection of uncontrolled hypertension, should be the next to appropriate pharmacological treatment assisted with therapy falls prevention and rehabilitation program.

3. Patients with good controlled hypertension benefit, not only in the prevention of cardiovascular events, but also to maintain good body balance.

4. Well-controlled blood pressure can prevent falls in the elderly.