

## SUMMARY

Cerebrovascular disease is one of the most common causes of death in the world. Despite the increase in the possibilities of treating stroke, the incidence of stroke has been increasing in recent years, which is related to the aging of the population. That is why it is so important to look for risk factors and eliminate them as soon as possible to reduce the risk of a stroke.

The **aim** of the study was to assess the frequency of modifiable risk factors for cerebral vascular diseases in the population of people aged 40-65 who visit GPs and AOS under the program “Bet on prophylaxis –Program for the Prevention of Cerebral Vascular Diseases in Mazowieckie, Podlaskie and Warmińsko–Masurian“. The assessment included in particular the presence of hypertension, lipid and carbohydrate metabolism disorders, excess body weight, the presence of heart disease and atherosclerotic lesions in the carotid arteries, smoking and alcohol consumption, diet and physical activity.

**Material:** The study covered a population of 120 professionally active patients aged 40-65, including 64 women (53,3%) and 56 men (46,6%). The patients were divided into two equal groups of 60 people. The first group consisted of patients with risk factors for cerebrovascular diseases identified by general practitioners. The second group consisted of patients who reported directly to the AOS with a TIA interview.

**Research methodology:** In order to conduct the study, the so-called “Checklists”, which, in addition to basic data, contained a number of questions about personal history, lifestyle, a column with blood pressure and anthropometric measurements. Basic physical examination with measurements of blood pressure, pulse, auscultation of both carotid arteries and anthropometric measurements was performed, as well as a neurological examination. All subjects were tested for glucose levels, lipid metabolism, and blood counts with smear. In addition, each patient had a resting ECG, heart echo, 24-h ECG holter, ultrasound doppler of carotid and vertebral arteries and CT of the head without contrast. For patients after TIA, the risk of stroke was assessed according to the ABCD2 scale.

**Results:** In the entire study population, excess body weight was found in 96 people (80%). Overweight was found in 52 subjects (43,3%), more often in men than in women, both in the general population and in group I. Obesity occurred in 44 patients, which constitutes 36,6% of the respondents. It occurred more often in group I, and also among men. Abdominal obesity according to IDF criteria concerned 96 (80%) people, it was diagnosed in 85% of patients in group I and 75% in group II. Among women, abdominal obesity was found in 50 patients, which constitutes 78,1% of the respondents, among men, abdominal obesity was found in 45

(80,3%) of the respondents. There was a statistically significant difference between the waist circumference in the studied groups, as well as between the values of BMI, hip circumference, waist circumference and WHR for women and men, in the general population and in group I.

Previously diagnosed hypertension was found in 53 people, which constitutes 44,2% of the respondents, including women (39,0%) and men (50,0%). There was a statistically significant relationship between the age group and history of hypertension. In the age group of 40-49 years, the history of hypertension occurred in 27.0%, in the group of 50-59 years in 55%, and in the group of 60-65 years in 47% of patients. Abnormal blood pressure values in patients suffering from hypertension were found in 58.5% of cases, more often in men than in women (64,3% vs 52%). Newly diagnosed arterial hypertension occurred in 26 people (21,7%) of the general population, 11 people (18,3%) in group I and 15 people (25%) in group II. There were statistically significant differences in SBP and DBP between the sexes in the general population and in group I, as well as between the BMI value and the history of HT and HT in the entire population.

Hyperlipidemia was the most common modifiable risk factor in my study and occurred in 104 people (86,7%), including 50 men (89,3%) and 54 women (84,4%). The history of hyperlipidemia was found in 45 people (37.5%) in the general population, in 25 people in group I (41,6%) and in 20 people (33,3%) in group II. In the general population and in group I, women had more frequent hyperlipidemia (39% and 46,6%, respectively). Abnormal lipid levels in people with a history of lipid disorders were found in 34 cases (75,5%), in 16 men (80%) and 18 women (72%). Newly diagnosed lipid disorders were found in 59 people (49,1%), in the group headed by a family doctor in 28 people (46,6%), and in the group with a history of transient cerebral ischemia in 31 people (51,6%), with a predominance of men in each test group. For the entire study population, as well as for groups I and II, statistically significant differences in the concentrations of HDL and TG cholesterol between women and men were found.

Previously diagnosed diabetes was diagnosed in 21 patients (17,5%). In women there were 9 (14,1%) cases of diabetes, in men 12 (21,4%) cases. Despite the treatment, 16 patients (61,9%) had abnormal fasting glucose levels. No cases of de novo diabetes were detected. In group I, abnormal fasting glycaemia was found in 23 people (38,3%), 9 women (30%) and 14 men (46,7%), while in group II in 22 people (36,7%), including 9 women (26,5%) and 13 men (50%). There were statistically significant differences in mean glucose values broken down by sex in the general population and in group I.

Atherosclerotic lesions in the carotid arteries were found in 70 patients (58,3%), 31 of them (44,3%) had atherosclerotic plaques, and in 10 patients (14,3%) it caused haemodynamically significant stenosis. These changes were more often observed in men (62,5%) than in women (54,7%). In group I atherosclerotic lesions were found in 31 cases (51,7%), and in group II – in 39 (65%). Atherosclerotic plaques in group I were found in 14 subjects (23,3%), of which 4 (6,7%) caused haemodynamically significant stenosis. In group II, 17 (28,3%) and 6 (10%) people, respectively.

The conducted cardiological diagnostics revealed the presence of atrial fibrillation in 5 (4,2%) people, in 2 women (2,2%) and 3 men (5,3%). The history of paroxysmal atrial fibrillation was declared by 3 people (2,5%). The performed diagnostics revealed the presence of permanent FA in 2 patients (1,7%), of whom had a history of paroxysmal FA. Moreover, 5% of the respondents showed a mildly reduced left ventricular ejection fraction. PFO was suspected in 3 people (2,5%), and ASD II in one (0,8%).

Only 26% of the surveyed people declared physical activity more than 3 times a week, with a slight majority of women (28,1%) over men (23,2%). In group I there were 19 (31,6%), 10 women (33,3%) and 9 men (30%), and in group II — 12 people (20%), including 8 women (23,5%) and 4 men (15,3%). There was a statistically significant relationship between physical activity and the age group in the general population and group II.

Smoking in the entire population was declared by 29 people, which is 24.2% of the respondents. Women (28,1%) used cigarettes more often than men (19,6%). In group I there were 11 women (36,7%) and 6 men (10,0%) smokers, and in the group with previous TIA – 7 women (20,6%) and 5 men (19,2%). In addition, 31,7% of the respondents were smokers in the past, of which 14.1% were women and 51,8% were men. On the other hand, 73.3% of the population used alcohol, most often occasionally (65%). 8.3% of the respondents drank more than once a week, and these were only men.

The recommended daily consumption of five portions of vegetables and fruit was declared by only 7% of respondents. On the other hand, 59 people (49,2%) eat more than once a week. 78 people (65%) used sweet fizzy drinks, especially men aged 50-59.

In the population of people with a TIA interview, 35 people (58,3%) were included in the low-risk group based on the ABCD2 scale, 23 people (38,3 %) were classified as moderate risk, and 2 people (3,3%) to the high-risk group.

It has been shown that the male gender predisposes to the development of atherosclerotic lesions in the carotid arteries and the ability to control fasting blood, and the female sex predisposes to abdominal obesity and low HDL concentration.

In terms of the values of measurable parameters in both study groups, a positive correlation was found between the anthropometric parameters — waist circumference and BMI, and the values of TG, GLU, thickness of the IM and LP complex, as well as a negative correlation between the above-mentioned parameters and HDL cholesterol concentration and EF.

### **Conclusions**

1. The study population showed the presence of numerous modifiable risk factors for cerebrovascular diseases, such as: arterial hypertension, overweight and obesity, abdominal obesity, hyperlipidemia, low physical activity, smoking, improper diet, alcohol consumption.
2. In the majority of patients with hyperlipidaemia and hypertension, other risk factors often coexist, most often overweight, obesity and abdominal obesity.
3. The correlations found between overweight and obesity as well as abdominal obesity and risk factors for cerebrovascular diseases indicate their coexistence and mutual correlation.
4. The prevalence of risk factors for cerebrovascular disease in both groups was high. In the group of patients with a history of TIA, the most common were hyperlipidemia and lack of physical activity, and in patients referred by GPs, hyperlipidemia and abdominal obesity.
5. Male gender predisposes to the development of atherosclerotic lesions in the carotid arteries and fasting glucose supplementation, female gender to abdominal obesity and lowHDL concentration.
6. The research I have carried out, as well as the lack of knowledge of patients about cerebrovascular diseases, show how important a role in the prevention of vascular incidents are preventive programs, especially in younger age groups.