



## PECULIARITIES IN THE DEVELOPMENT OF CHRONIC CEREBROVASCULAR PATHOLOGY WITH ARTERIAL HYPOTENSION IN YOUNG PATIENTS

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### Abstract:

Chronic cerebrovascular diseases (CVDs) occupy the leading position among all pathologies of the nervous system leading to temporary or permanent disability. The main causes of CVD are arterial hypertension (AH), narrowing of the main arteries of the head, disorders of rheological and coagulation properties of blood, essential arterial hypotension (EAH), vertebral artery compression and some other causes [1,2,9]. The mechanisms of chronic cerebral ischemia eventually lead to the development of the clinical syndrome of discirculatory encephalopathy, manifested by subjective and objective signs of organic brain pathology. The modern socio-economic situation, increased neuropsychological stresses have led to the rejuvenation and widespread occurrence of CVD [5,7,8].

**Keywords:** Chronic cerebrovascular disease, arterial hypotension, young age, brain, neurologia.

**INTRODUCTION.** Clinical, pathomorphological, neuroimaging, and experimental results indicate a multidimensional damaging effect of arterial hypotension on the brain that contributes to the progression of atherosclerotic changes in cerebral vessels and the occurrence of acute cerebral ischemia [3,6]. Despite the extensive use of new neuroimaging technologies, the significance of comparing clinical and neurophysiological criteria of progression of neurological disorders in arterial hypotension is not reduced [2,10]. At the same time, prognostic criteria of neurological disorders progression, their dynamics and relationship with provoking factors remain poorly studied. There are insufficiently developed treatment programs in the presence of neurological disorders against the background of arterial hypotension. There is no single standard algorithm for diagnosis and therapy of this pathology [7,11].

**PURPOSE OF THE STUDY:** to study clinical and neurological features in the development of chronic cerebrovascular pathology in hypotensive patients of young age

### MATERIALS AND METHODS OF RESEARCH:

To establish the incidence of AH we surveyed 216 employees of the 1st clinic of Samarkand State Medical University, aged from 20 to 44 years (young age according to WHO, 2016). As a result of questioning we have established that 67 employees (31%),

according to criteria of diagnostics had AH, from them 65 women and 2 men, we connect predominance of female sex with specificity of work, in medical institutions women work in most cases. We also examined 27 patients with AH who received inpatient treatment in the 1st clinic. The patients' age varied from 30 to 44 years (mean age -  $37,5 \pm 1,3$  years). The duration of AH averaged  $16,4 \pm 0,3$  years. To achieve the set aim and objectives, we carried out a comprehensive examination of 94 patients with AH from 20 to 44 years of age (mean age  $36,9 \pm 0,5$  years). Of them 14 men (mean age  $36,0 \pm 0,8$  years) and 80 women (mean age  $37,2 \pm 0,9$  years) constituted the study group.

The studies were repeated in dynamics 6 months after the formation of the treatment groups. Consultations with a cardiologist, an ophthalmologist, and a therapist were prescribed when indicated.

The obtained data were statistically processed on a Pentium-4 personal computer using the programs developed in the EXCEL package using the library of statistical functions. Differences of mean values were considered reliable at significance level  $P < 0,05$ .

### RESULTS OF THE STUDY :

When interviewed, it was found that all patients had repeated periods of poor well-being. These periods were mostly characterized by increased fatigue (84 (89.4%) patients), the occurrence of headache (89 (39.4) patients), and fainting states (17



(18.1%) patients). The most frequent complaints in AH patients were headaches and dizziness, predominating in group 2.

However, the association of headaches with a decrease in blood pressure was indicated more frequently by Group 1 patients. A decrease in work capacity was also noted in a greater number of Group 1 patients. Other complaints were registered with equal frequency in both groups. Most patients (44.9%) complained of headache in the frontal-temporal and frontal areas. Next in frequency were headaches of occipital localization (24.7% of patients), less frequent were those of parietal localization (8.9% of patients), parietal-frontal localization, and - hemicranias (3.2% of patients).

Cephalgias were pulsating in 39.3% of patients, compressive in 18% of patients, oppressive in 16.4% of patients, pressing in 26.2% of patients, and diffuse in 19.7% of patients. However, the differences in the character of headaches in AH patients in the designated groups were statistically insignificant. Headaches occurred in 17 (85%) group 1 patients and 72 (97.3%) group 2 patients. In Group 1, the cephalgias had no dependence on the time of the day, whereas in Group 2, they predominantly appeared in the morning hours or in the afternoon. Headaches intensified under the influence of physical and psycho-emotional factors. Analgesics, caffeine-containing drugs, coffee, tea, as well as passive rest, often short naps, were used to relieve the headaches. In Group 1, headaches disappeared after sleep in 60% of the patients, while in Group 2, only 17.6% of patients had headaches.

Symptoms of morning asthenia (difficulty waking up, inability to be active mentally and physically immediately after sleep) in Group 1 bothered 60.0% of patients, in Group 2 the frequency of these symptoms was somewhat higher.

Morning face swelling was detected in 25.0% of patients in Group 1, and in Group 2 - in 58.5% of patients ( $P < 0.05$ ); "tight collar" syndrome - in 30.0% of patients in Group 1, and in 41.9% of patients in Group 2. Eyes rushing in the first half of the day, and "low cushion" symptom were registered exclusively in - Group 2: respectively, in 43.2% and 21.6% of patients. Complaints characteristic of venous discirculation increased in Group 2 and were statistically significant in some cases ( $P < 0,05$ ). Autonomic complaints occurred in 100% of group 1 patients and 76.6% of group 2 patients.

In Group 1, patients complained more frequently of presyncopal and syncopal states (85.0%

of patients), hyperhidrosis or acrocyanosis (55.0% of patients), and cardialgia (25.0% of patients).

Group 2 was dominated by complaints of numbness, coldness of hands and feet (77.0% of patients;  $P < 0.05$ ), tendency to redden or pale face when agitated (45.9%), feeling of lack of air (60.8% of patients), increased sweating (56.8% of patients), less often patients in this group complained of cardialgia (32.4% of patients) and lipothymia, syncope (41.9% of patients;  $P < 0.05$ ).

One of the significant factors in the anamnesis of patients with AH is aggravated heredity. It was found out that the percentage of heredity for arterial hypotension in the relatives was in 75,7% of cases (more often in the first maternal line relatives). Exogenous factors determining low BP in AH patients included excessive salt intake (64.9% of patients) and low fluid intake (84.0% of patients).

Signs of autonomic-vascular disorders were found in 83.0% (78 of 94 patients) of patients with AH. Alterations of vegetative sphere were of diverse character: tremors of eyelids and fingers of outstretched hands were revealed in 20.2% of patients, hyperthermia - in 9.6%, hyperhidrosis - in 27.7%, signs of Raynaud's syndrome - in 28.7%, change of skin coloring - in 29.8% of patients. Meteorological dependence, difficulty of adaptation in changing climatic conditions were noted in 44.7% of patients. Almost one third of the examined patients had asymmetry of vegetative manifestations.

Signs of autonomic dysfunction in the form of eyelid and finger tremors (40% vs. 14.9%;  $P < 0.05$ ), changes in skin color (45.0% vs. 25.7%), and hyperthermia (15.0% vs. 8.1%, respectively;  $P < 0.05$ ) slightly prevailed in Group 1.)

In the 2nd group, there was a significantly more frequent occurrence of meteorrhidrosis (50% vs. 25%, respectively;  $P < 0.05$ ), without significant decrease, there was an occurrence of hyperhidrosis, Rayna syndrome, and asymmetry of vegetative manifestations.

All patients of the main group had lower BP values, which corresponded to the criteria of arterial hypotension. However we found the tendency of lower values in patients with CHEM against the background of AH that could be considered as a consequence of sympathicotonia, aimed to improve blood supply of the body.

While analyzing the neurological status, we found that some disorders were revealed only



in the 2nd group, while no neurological symptomatology was observed in the 1st group.

Anxiety scores in the emotional sphere were reliably elevated in the group of patients, both on the reactive and on the personality parameter. Significant prevalence of anxiety was observed in the 2nd group in comparison to the 1st group ( $P < 0,05$ ). In our opinion, the presence of the fact of memory impairment is already a reason for the formation of anxiety disorders.

The sum of MMSE scale scores of Group 1 patients was  $24,8 \pm 0,53$  ( $P < 0,001$ ), while that of Group 2 patients was  $23,4 \pm 0,09$  ( $P < 0,001$ ), which testified to moderate cognitive disorders in both groups of examinees, with predominance of Group 2 patients. Our analysis of the severity of cognitive impairment according to the MMSE test showed that group 2 patients had a more pronounced cognitive deficit than group 1 patients ( $P < 0,05$ ). Normal values had 3.8% of patients in Group 1 and 1.8% in Group 2. In Ag patients without signs of CHEM, the neurodynamic component of cognitive processes and the rate of thought operations did not change compared to patients with signs of CHEM. In contrast to patients with CHEM against the background of Ag, a uniform distribution of P300 amplitude was noted in the group of patients with AH. Inter-peak P300 amplitude in patients with CHEM on the background of Ag was noted in the frontal leads in the complex verbal test. On the one hand, this fact may be a manifestation of the stages of the process (in most cases, the frontal lobes are involved in the pathological process later than other brain regions, and at the stage of CIM formation the preservation of interpeak amplitude in the frontal regions of the brain is possible).

### **CONCLUSIONS.**

The incidence of cognitive impairment in patients with AH is 78.7%, while in CHEM it varies up to 98.2%. Cognitive disorders in CHEM are based on the phenomenon of cortical-cortical and cortical-cortical dissociation observed in the vast majority of clinical cases of CHEM. In 60.6% of patients with AH, a decrease in the diurnal BP index due to insufficient increase in systolic BP during the daytime hours is observed. In AH patients with cerebrovascular pathology there is 24-hour sympathetic activation on the background of parasympathetic deficit. Cerebral hemodynamics in the carotid system in AH is characterized by a moderate reduction of arterial

inflow and compensatory reduction of vascular resistance. In pathology of cerebral vessels, hemodynamics in the vertebral arteries decreases to the lower limits of normal values.

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