УДК 611.813.14:616.13-004.6-053.9:612.014.5

PATHOMORPHOLOGICAL EXAMINATION OF THE HIPPOCAMPUS IN CEREBRAL ATHEROSCLEROSIS

Sayidzhonova Feruza Latifjonovna, assistant.,

Razakov Bakhtiyor Yusufovich, assistant.

Department of Pathological Anatomy and Forensic Medicine

Andijan State Medical Institute

(Uzbekistan)

Resume,

In recent years, according to WHO, mortality from coronary heart disease, the main cause of which is atherosclerosis, has increased significantly (up to 75%). To varying degrees, atherosclerosis can be detected in almost every person. After all, the earliest pathological changes in the vessels (lipid spots and stripes), characteristic of the initial stage of this disease, appear in children and adolescents as early as 10-15 years. Men get sick more often than women, and the latter develop atherosclerosis on average 10 years later than men. These differences are the result of different lifestyles, the nature of nutrition, occupation, genetic characteristics, neuro-hormonal factors, etc.

Cerebral atherosclerosis is the most common form of vascular pathology of the brain, which is the main cause of ischemic disorders of cerebral circulation. Chronic cerebral ischemia is the most frequent and most socially significant form of cerebrovascular pathology. There are many works in the Russian literature devoted to the study of higher brain functions in chronic cerebrovascular pathology. All this testifies to the importance and relevance of the problem of atherosclerosis.

Key words: hippocampus, atherosclerosis, brain, morphology.

ПАТОМОРФОЛОГИЧЕСКОЕ ИССЛЕДОВАНИЕ ГИППОКАМПА ПРИ ЦЕРЕБРАЛЬНОМ АТЕРОСКЛЕРОЗЕ

Сайиджонова Феруза Латифжоновна, ассистент.,

Разаков Бахтиёр Юсуфович,ассистент.
Кафедра патологической анатомии и судебной медицины
Андижанский государственный медицинский институт
(Узбекистан)

Резюме,

За последние годы, по данным ВОЗ, значительно увеличилась (до 75%) смертность от ишемической болезни сердца, основной причиной развития которой является атеросклероз. В различной степени атеросклероз можно выявить практически у каждого человека. Ведь самые ранние патологические изменения в сосудах (липидные пятна и полоски), характерные для начальной стадии этого заболевания, появляются у детей и подростков уже в 10-15 лет. Мужчины болеют чаще, чем женщины, причем у последних **атеросклероз** развивается в среднем на 10 лет позже, чем у мужчин. Эти различия являются следствием различного образа жизни, характера питания, рода занятий, генетических особенностей, нервно-гормональных факторов и пр.

Церебральный атеросклероз - самая распространённая форма сосудистой патологии головного мозга, являющаяся основной причиной ишемических нарушений мозгового кровообращения. Хроническая ишемия мозга является самой частой и наиболее социально значимой формой цереброваскулярной патологии. В отечественной литературе немало работ, посвященных изучению высших мозговых функций при хронической цереброваскулярной патологии. Все это свидетельствует о важности и актуальности проблемы атеросклероза.

Ключевые слова: гиппокамп, атеросклероз, головной мозг, морфология.

Relevance. One of the most common diseases today is atherosclerosis. Its danger lies not only in its long and asymptomatic development, but also in its

ability to affect different arteries and vessels. Pathology of the lower extremities can lead to gangrene of the coronary vessels and aorta - to myocardial infarction, and cerebral vessels - to stroke [2,5]. The cerebral form is one of the varieties of atherosclerosis, and differs from the rest in that it occurs both in young people and in elderly people. The symptoms of the disease are often similar to the symptoms of fatigue, therefore, atherosclerosis is often diagnosed already in the late stages, when the patient's life is in mortal danger[1].

The currently available data on the pathomorphology of the brain in the absence of cerebral circulation of atherosclerotic genesis, including those obtained using modern methods of neuro- and angiovisualization, mostly relate to its substance - cortical and subcortical structures, brain stem and cerebellum. When making a diagnosis of chronic cerebral ischemia, it is often implied that a decrease in memory and other cognitive functions in a patient with cerebral vascular insufficiency is a direct result of chronic cerebral ischemia [3]. But in reality, the relationship between cognitive disorders and cerebrovascular insufficiency may be more complex.

The mechanism of dissociation formation is associated primarily with arterial hypertension, which leads to secondary changes in the vascular wall, mainly of the microcirculatory bed. Arteriosclerosis, which develops as a result, leads to a change in the physiological reactivity of blood vessels [3].

Currently, it is known that the function of the limbic system of the brain is not limited only to emotional reactions, but also participates in maintaining the constancy of the internal environment (homeostasis), regulation of the sleep–wake cycle, learning and memory processes, regulation of autonomic and endocrine functions [5]. The hippocampus, as the central link of the limbic system, participates in the highest coordination of reproduction and emotional behavior, as well as in the processes of assimilation and memorization of new information, which affects the emotionally colored awareness of perceived reality and, in general, the quality of life. The hippocampus plays a corrective role in enhancing the inhibitory effects of stress response, blood pressure regulation [4].

Cerebrovascular disease ranks second among diseases of the circulatory system in the structure of the initial causes of death according to autopsy results [4]. The morphological basis of cerebrovascular disease in most cases is cerebral atherosclerosis [2]. Despite numerous literature data on the problem of cerebral atherosclerosis [1,5], morphological features of the hippocampus in this disease remain unexplored.

The purpose of the study. The purpose of this study was to study the morphology of the hippocampus in cerebral atherosclerosis.

Materials and methods of research. During the subsequent pathological examination, we selected cases in which cerebral atherosclerosis was detected in the deceased, and the main diseases were: coronary heart disease (27.4%), arterial hypertension (41.6%), cirrhosis of the liver (19.8%), chronic obstructive bronchitis and bilateral pneumonia (11.2%). The fixation of the material for microscopic examination was in neutral 10% formalin and Buena liquid for 24 hours, pouring into paraffin was carried out according to the generally accepted method.

To study the elements of the central nervous system, thionine staining was performed using the Nissl method. To study the neurotopography of the hippocampal layers and to assess the mutual disposition of nerve fibers, neurons and glia, the method of impregnation of paraffin sections with silver nitrate according to Bilshovsky in the Landau modification for paraffin sections was used. The analysis of quantitative indicators was performed on IBM using the statistical software package "Statistica" v 6.0.

The results of the study. The features of the cytoarchitectonics of the pyramidal layer of the hippocampus served as the basis for its division into 4 main fields oriented in the mediolateral direction and designated as CA1 – CA4. The main fields of the hippocampus proper are the fields CA1 and CA3. In all the studied deceased elderly men, a pathoanatomic examination revealed atherosclerosis of the cerebral arteries with damage to the middle cerebral artery at the stage of fat spots and atheromatous plaques with lumen stenosis of less than

30%. According to medical records, there was no clinical picture of dyscirculatory encephalopathy.

Microscopic examination of the hippocampus revealed in most cases the presence of pericellular edema, especially in the ganglion layer in all zones, as well as a different degree of severity of lipofuscinosis of neurons. Granular globular cells (activated macrophages) were often found in the subependimal parts (alveolus) and perivascularly. In most cases, circulatory disorders were observed in the vessels of the microcirculatory bed in the form of fullness, less often stasis. In some cases, in persons of the pecnic somatotype, fresh diapedetic perivascular hemorrhages were detected from minor to more pronounced, which may be due to the hypoxic nature of damage to the cortical structures of the brain in the terminal period.

In addition, damaged neurons with dark cytoplasm of the pericaryon and dark pycnotic nuclei were detected, as well as the appearance of microgia near the pericaryon neurons (gliosis). In the semi-quantitative analysis of morphological changes, the most pronounced changes were observed in the CA1 and CA3 zones. At the same time, signs of spongiosis and lacunar structure were more often found in CA1.

Considering that cerebrovascular insufficiency is characterized by hypoglycemia, cerebral ischemia and, as a consequence, leads to damage to brain neurons, activation of apoptosis mechanisms, our study shows that in the hippocampus of deceased elderly men in the early stages of cerebral artery atherosclerosis in the absence of clinical signs of dyscirculatory encephalopathy, structural signs of damage to ganglion layer neurons and reactions from gliocytes are observed.

The detection of circulatory disorders in the vessels of the microcirculatory bed of the hippocampus is comparable with the results of some researchers demonstrating damage to the vascular wall and cerebral blood flow in cerebrovascular disease, which, in turn, can lead to cognitive disorders and changes in the emotional sphere.

Conclusion. Thus, in the hippocampus of elderly men with atherosclerosis of the cerebral arteries in the early stages, pronounced changes were found in the CA1 and CA3 zones, which were characterized by complex reversible damage to neurons, spongiosis, circulatory disorders, perivascular and pericellular edema of varying severity, as well as the formation of focal structures of lacunar structure.

LIST OF LITERATURE:

1. Arushanyan E.B., Beyer E.V. // Journal of Neurol. and psychiat. - 2007. - Vol. 107. - No. 7. - pp. 72-77.

2. WHO. Newsletter. - Geneva, 2008. - No. 310.

3. Gorelik E.V., Smirnov A.V., Krayushkin A.I., Grigorieva N.V. Features of the structure of the hippocampus of elderly and senile women with cerebral atherosclerosis taking into account the somatotype // Bulletin of the Volgograd State Medical University. un-ta. – 2009. – № 4 (32). – Pp. 61-63.

4. Dunaev V.V., Kovalenko S.I. Correction of experimental disorders of cognitive functions by antioxidants // Biomedical and biosocial anthropology. - 2004. - No. 3. - pp. 113- 115.

5. Kovalenko S.I., Belenichev I.F., Bukhtiyarova N.V. Quinazoline derivatives - promising neuroprotective agents with an antioxidant mechanism of action // Constipation. med. zhurn. - 2004. - T. 2. – № 1 (22). – Pp. 1-7.

6. Manvelov L.S. On some results of the study of the initial manifestations of insufficient blood supply to the brain // Clinical Medicine. - 2005. - No. 5. - pp. 28-30.