МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

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106-ї підсумкової науково-практичної конференції
з міжнародною участю
професорсько-викладацького колективу
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Матеріали підсумкової 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) – Чернівці: Медуніверситет, 2025. – 450 с. іл.

У збірнику представлені матеріали 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) зі стилістикою та орфографією у авторській редакції. Публікації присвячені актуальним проблемам фундаментальної, теоретичної та клінічної медицини.

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subnuclei and quantitative analysis of RNA content were performed on a computer system for digital image analysis of VIDAS-386 (Germany) in the visible spectrum.

Results. The function of neurons of medial small cell and lateral large cell subnuclei of the PVN of rat hypothalamus is marked by circadian rhythms. The decrease in densitometric parameters is more pronounced in the lateral large cell nuclei, in particular in the samples taken for study at 2 am there was a probable decrease in the area of the neuron by 11.2% ($p < 0.01$) due to a decrease in the area of its nucleus by 13.8 % ($p < 0.01$), nucleoli - by 10.6% ($p < 0.05$) and cytoplasm by 7.8% ($p < 0.05$). Also, a decrease in RNA concentration is observed in the nucleus - by 7.1% ($p < 0.05$) relative to similar values obtained during the day. Under the conditions of light deprivation, desynchrony of the activity of studied neurosecretory cells of the hypothalamus and a shift of the largest values of the area of the neuron structures from 2 pm to 2 am are manifested.

Conclusions. Absence of the expressed strengthening of functional activity of medial small-cell subnuclei and probable differences of the area of neuron bodies, their nuclei, nucleoli, cytoplasm, and concentration in them of RNA. Nuclear-cytoplasmic ratio, specific nuclei, and cytoplasm in animals exposed to light modes I2.00L: 12.00D and 24.00L: 00D allows us to assume wide limits of the plasticity of the studied neurosecretory cells when keeping animals under constant lighting conditions during the week.

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PRENATAL TRANSFORMATIONS OF THE TEMPORAL BONE

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Introduction. Congenital malformations of the temporal bone (including anomalies of the external, middle, and internal ear) can cause severe diseases in children, for example, hearing loss and balance problems (Yiin R.S.Z. et al., 2011). L. Sennaroglu et al. (2002) proposed classifications of internal ear abnormalities that include complete labyrinthine aplasia, cochlear aplasia, common cavity, incomplete division of types I and II, auricle hypoplasia, semicircular canal anomalies, and enlarged vestibular labyrinth. These defects usually develop in the embryonic and early pre-fetal periods, therefore, clarification of the features of the embryogenesis of the temporal bone is an actual direction of morphological research.

The aim of the study of the study is to clarify the peculiarities and chronological sequence of the sources of the rudiments and the dynamics of morphological transformations of the temporal bone in the prenatal period of human ontogenesis.

Material and methods. Research was performed on 12 specimens of embryos and pre-fetuses, and 14 specimens of human fetuses using microscopy, morphometry, x-ray techniques, 3D reconstruction, and statistical analysis. The investigations were performed keeping to the major regulations of the European Union Convention on Human Rights and Biomedicine (04.04.1997), the Declaration of Helsinki on Ethical Principles for Medical Research Involving Human Subjects (1964-2008), EU Directives №609 (24.11.1986), the Orders of the Ministry of Health of Ukraine № 690 dated 23.09.2009, №944 dated 14.12.2009, № 616 dated 03.08.2012.

Results. It was found that at the beginning of the 4th week of intrauterine development, the sources of the facial, frontal, sphenoid, and squamous part of the temporal bones are determined, which originate from the neural crest, and the paraxial mesoderm is the source of the parietal, petrous part of the temporal and occipital bones. Embryologically, the temporal bone is divided into two main anatomical parts. The cranial nerves and the otic capsule (helix and vestibular apparatus) originate from the neuroectoderm. Everything else, including the auditory ossicles, arises from the neural crest. Some of the components of the neural crest form parts of the viscerocranium in the 7th week of intrauterine development, in particular the mandible and maxilla, incus and malleus (first branchial arch), as well as the stapes and styloid process of the temporal bone (second branchial arch). The rudiment of the temporal bone has four separate components, which ossify both through the membranous and cartilaginous pathways. During the 7-8th week of intrauterine development, the squamous part of each temporal bone is ossified by membranous ossification, which spreads

forward from the focus at the base of the zygomatic process. The zygomatic process of the temporal bone grows from this center of ossification. At the beginning of the fetal period of ontogenesis, the tympanic ring, which surrounds the external auditory canal, begins to form from four membranous ossification centers. Over time, this ring expands laterally and posteriorly, forming the tympanic part of the temporal bone. The anterior and posterior parts of this ring grow faster than the rest of the ring; as a result, there is a defect at the bottom of the passage – the Gushke foramen. The petrous part of the temporal bone ossifies in a cartilaginous way around the otic capsule with more than ten centers, which are first visible at the end of the 4th month of intrauterine development, and merge at the 6th month of intrauterine development after the cochlear labyrinth reaches its final size. By the 6th month of intrauterine development, the otic capsule is almost completely ossified.

Conclusions. 1. At the beginning of the 4th week of intrauterine development, the sources of the temporal bone are determined – its squamous part comes from the neural crest and the petrous part – from the paraxial mesoderm. 2. During the 7th-8th weeks of prenatal ontogenesis, the squamous part of the temporal bone ossifies in a membranous way, and the petrous part – in a cartilaginous way around the otic capsule with more than ten centers, which are first visible at the end of the 4th month, and merge at the 6th month of prenatal development.

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FEATURES OF STRUCTURAL CHANGES OF THE HYPOTHALAMIC SUPRAOPTIC NUCLEUS IN RATS DURING THE EARLY DIABETES 2

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Introduction. «Diabetes is currently a global health burden affecting over 537 million people worldwide» (Mosili P., 2024). Various complications, such as cardiovascular and chronic kidney disease, are widely reported and studied, while studies about the influence on the brain are not so common.

The aim of the study. To determine the structural organization of the hypothalamic supraoptic nucleus in rats with streptozotocin-induced diabetes.

Materials and Methods. In the experiment, mature rats were used and modeled with streptozotocin-induced diabetes. On the 14th day of the experimental diabetes development in rats, quantitative cyto-myeloarchitecture parameters, and histological and ultrastructural changes in the anterior hypothalamic supraoptic nucleus were determined.

Results. After 14 days of the experiment modeling, the histological structure of the hypothalamic supraoptic nucleus remained practically unchanged and identical to the intact animals. However, occasional occurrences of central chromatolysis were observed in the light neurons of the supraoptic nucleus. The perikarya of the dark neurons were densely filled with Nissl substance.

The ultrastructural feature of dark neurosecretory cells is the presence of highly developed granular endoplasmic reticulum in their peripheral zone, which was represented by flat elongated cisterns. These cisterns had a large number of ribosomes on their surface. Additionally, free ribosomes and polysomes were present in the hyaloplasm between the cisterns. A similar pattern has been observed in light neurons. Furthermore, an increase in the volumetric density of neurosecretory granules compared to intact indicators of up to $2.36 \pm 0.12\%$ ($p \leq 0.01$) has been detected. In the neuropil of the hypothalamus, most of the axons were filled with neurosecretory granules (NG) of moderate electron density. Alongside axons that were expanded and filled with neurosecretory granules, axons of neurosecretory cells with a usual structure containing mitochondria, synaptic vesicles, neurotubules, and neurofilaments have been observed.

Conclusions. The hypothalamic supraoptic nucleus contained light and dark neurosecretory cells with a well-developed protein synthesis apparatus. Changes of the neuro-glio-capillary complexes in the investigated hypothalamic nuclei were detected on the 14th day of the experimental streptozotocin-induced diabetes, indicating the activation of neurosecretion synthesis and the transport to the neurohypophysis. An increase in the volumetric density of neurosecretory granules compared to intact animals was found to be $2.36 \pm 0.12\%$ ($p \leq 0.01$).