

*Materials of Conferences***CEREBELLUM INBRED ALBINO RATS
DURING EARLY ONTOGENY**

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This study was performed in accordance with the thematic plan of research Kharkiv National Medical University, Ministry of Health of Ukraine in the framework of research project: Department of Human Anatomy «Morphological peculiarities endocrine system, nervous and vascular system under normal conditions and under influence some factors» (state number registration 0108U007050). The author is responsible for the investigation of the central nervous system.

Introduction. In studies of age-related changes of physiological systems of the human body in recent years there has been increased interest in the earliest stages of postnatal ontogenesis. This is due to several reasons, medical and social nature: demography, ecology and, above all, children with a history of fertility status – prematurity, functional immaturity, congenital disorders of physiological systems of various origins (genetic, infectious, etc.).

The object of research at the preclinical stage are laboratory animals, and in many cases – these white rats.

According to the physiological state of the newborn animals white rats are immature (immaturantnym) [3–5]. Man under normal harboring also born immature. According to the degree of immaturity of newborn baby rat closer to premature babies. However, just one month accelerated development of the animal becomes an independent individual. In humans, the longest period of immaturity of all mammals [1, 2]. However, both infants – a child, and the experimental animal characterized by incomplete formation – maturation of the central nervous system at the stage of embryonic development [4]. The most immature at birth, even in normal children are matured by the cerebellum and the cerebral cortex [7]. In connection with this motor activity is characterized by their lack of spontaneity and coordination. Premature infants have low physical activity, muscular hypotonia, hyporeflexia, tremors, ocular nystagmus. If these features are characterized by three weeks old, we can assume the presence of diseases associated with the pathology of the nervous system. [6]. The newborn albino rats on the overall assessment of the development there is a significant incompleteness: they blind, outer does not open the ear, they do not detect elements of motor activity.

Objective: to study the morphological features of the development of the cerebellum inbred albino rats during early ontogeny.

Material and methods. Observations carried out in 10 broods of albino rats born to 10 female and 3 male rats of the same species in individual cage. Each broods of 9 to 12 rats. Total number of animals in the experiment was 98. The animals were kept under standard vivarium conditions KhNMU.

Methods: morphometric, time-study, macroscopic-microscopic, gistotopographical, histological (hematoxylin and eosin, by Niss'1), statistical.

Results and discussion. The animals were divided into two groups be called «observation» and «morphological» where the object of study is the brain and the cerebellum of the white rat during early ontogeny. In the «observation» group consisted of rats in an amount of 14. In the «morphological» group consisted of rats in an amount of 84. The research work was divided into two phases. At the first stage monitors and time-study of development of motor activity of albino rats from the first day and during the first month of postnatal life, as determined by body weight and linear dimensions of rats. At the second stage of the work we measured morphometric parameters of the brain and cerebellum (their linear dimensions, mass determination). Weigh conducted twice daily (9:00 and 19:00). To determine the linear dimensions of the body of a white rat baby laid out on graph paper and it marks the point of the distance from tip of nose to tip of tail rectified. Extracted whole brain was laid out on a square cut filter paper (pre-weighed on an analytical balance), and organs were weighed on the same scale. Brain moved on graph paper laid on her ruler with a scale of 1 mm. and photographed with a digital camera to visualize the actual size of the body in the photo. Linear dimensions (length, width, height) of the whole brain and cerebellum were measured electronic caliper – Micol accuracy of 0,01 mm. After measurement of the brain as a whole, separated from the cerebellum and brain stem was carried out to weigh it and determine linear dimensions. This study shows that during the entire period of observation weight of growing animals increased relatively evenly. By day 22, it increased almost 4 times as compared to newborn animals. Linear dimensions of the body of rats also grew about the same rate during most of the observation period, excluding the time between 7 and 9 in the afternoon, where there was an accelerated growth rate. Studying the increase in brain mass in growing animals have shown that the most intense of his growth was 7 to 12 days of postnatal life albino rats. By day 22, this index increased 2,6 times compared with newborn animals. At the same time the mass of the cerebellum increased with relatively equal rate throughout the period of observation. By day 22 the mass of the cerebellum increased 3,5 times compared with newborn animals. By evaluating the results of changes in brain

size in growing animals we have found that 3 to 5 days there was an increase growth of the brain, other days the rate of increase of this index remained approximately the same. Also no significant changes were identified based on the weight of the cerebellum on the weight of the brain during the first 22 days of life compared with newborn animals. This may indicate that 22 days of postnatal life, the growth rate as the brain and cerebellum of albino rats are high and close to the growth rate. However, by day 22 of their mass ratios remain at the level of indicators of newborn animals. Evaluating the development of the structural organization of the cerebellum according **gistotopographical** sections, it has been found that folding of the first signs appear on day 3, the development in the central part of the cerebellum, and then the process of forming the lobes extend to the caudal part. By 9–12 day in the rostral part is also detected the presence of lobules. By day 22 rat cerebellar development sufficiently formed 10 portions, which are characteristic of the cerebellum of these animals in a mature state.

Conclusions

We studied the morphological features of cerebellar development inbred albino rats during early ontogeny.

1. During the first 22 days of postnatal life, inbred albino rat brain mass growth rate increased from 7 to 12 days, and the weight of the cerebellum is stored uniformly throughout the observation period.

2. By day 22, the relative weight of the brain and cerebellum remains at level of newborn animals, and the forming of the folding of the cerebellar cortex is finished.

3. Found that by day 22 a mature state of motor activity reached characteristic of this type of animal.

We studied the morphological features of the development of the cerebellum inbred white rats during early ontogenesis. The observations were made in 10 broods white rats were born to 10 female and 3 male rats of the same species in individual cells. Each brood there was from 9 to 12 pups. The total number of animals in the experiment was 98. Number of techniques were used: morphomet-

ric, time studying, macro-microscopic, **histotopographical**, histological (**hematoxylin** and eosin stain, by **Nissl**), statistical. In studies of age changes of the physiological systems of the human body in recent years there has been increased interest in the earliest stages of postnatal ontogenesis. We found that during the first 22 days of postnatal life, brain mass inbred white rat growth rate increased from 7 to 12 days, and the masses of the cerebellum remains same throughout the observation period. By the 22nd day of the relative weight of the brain and cerebellum remains at indicators of newborn animals and finishes the forming of the folding of the cerebellar cortex. It found that mature state of physical activity, which characteristic for this type of animals, is reached by 22 day.

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