

to increase in rats without diabetes after 20-minute carotid ischemia-one-hour reperfusion. In the presence of diabetes mellitus in this period the content of malonic aldehyde and the activity of all antioxidant enzymes in the dominant depression of the last ones decrease. On the 12th day of the postischemic period in rats without diabetes mellitus, the increase in malonic aldehyde content is to some extent compensated by increased superoxide dismutase activity, and in animals with diabetes mellitus the inactivity of lipoperoxidation occurs in the background of depression of all antioxidant enzymes.

In the absence of diabetes in the early period of observation, the content of products of oxidative modification of proteins increases; on the 12th day, these values return to control values. In rats with diabetes mellitus, the increase in the content of products of oxidative modification of neutral proteins in the early post-ischemic period to the 12th day of observation persists, and the content of products of oxidative modification of proteins of the main character in the late post-ischemic period decreases. Regardless of the direction of changes in the content of products of oxidative modification of proteins in cerebral ischemia-reperfusion, in animals with diabetes mellitus in both observation periods their content significantly exceeds the corresponding values in animals without diabetes mellitus, indicating a higher intensity of their oxidation.

Diabetes mellitus changes the response of prooxidative-antioxidant homeostasis to cerebral ischemia-reperfusion in both terms of ischemia-reperfusion.

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PATHOPHYSIOLOGICAL MECHANISMS OF THE EPIPHYSIS EFFECT ON THE ION-REGULATORY FUNCTION OF THE KIDNEY UNDER CONSTANT DARKNESS

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Doctors have been aware of the rhythmic organization of certain body functions for a long time. In healthy people, the rhythms of physiological processes are synchronized with each other and with the rhythms of the environment which provides optimal conditions for the functioning of the body and is a sign of health.

The aim of our research was to study the pathophysiological mechanisms of the pineal gland on the ion-regulating function of the kidneys under conditions of constant darkness. The experiments were performed on 72 sexually mature nonlinear male albino rats weighing 0.15-0.18 kg. The animals were kept in a vivarium at a constant temperature and humidity on a standard diet. The control group consisted of animals ($n = 36$), which were kept under normal light conditions (12.00C:12.00T) for 7 days. The experimental group consisted of animals ($n = 36$), which were in constant darkness (12.00T:12.00T) for 7 days. On the 8th day, the animals were subjected to a 5% water load warmed to room temperature with tap water and the parameters of ion-regulating function of the kidneys under conditions of forced diuresis were studied. The studies were performed at 4-hour intervals during the day. Concentration, excretion, absolute and relative reabsorption, proximal and distal transport of sodium ions, concentration index, sodium / potassium ratio and clearance of sodium ions were studied. Diagnosis of functional features was based on the analysis of changes in the characteristics of the mesor (average daily level), amplitude, acrophase and shape of the circadian rhythm curve. The obtained individual chronograms for each animal were grouped on the principle of identity of the maximum acrophase and calculated by the method of "Cosinor analysis" average for each group of chronograms mesor, amplitude and phase structure (time interval between acro- and bathyphase). All stages of the experiment were carried out in compliance with the basic requirements of the European Convention for the Treatment of Animals. The obtained experimental data were processed on personal computers by the EXCE-2003 software package (Microsoft Corp., USA). The values of the arithmetic mean (\bar{x}), its variance and the error of the mean (S_x) were calculated for all indicators. To identify the probability of differences in the results in the experimental and control groups of animals, the Student's ratio (t) was determined, and then the probability of differences in the samples (p) and the confidence interval of the mean

according to the Student's distribution tables were studied. Values for which $p < 0.05$ were considered probable.

An average daily level of sodium ions in the urine increased reliably. High natrium uresis was recorded at all study intervals. The acrophase remained unchanged, but the rhythm amplitude increased by 35%. Changes in the ion-regulatory function of the kidneys were also characterized by a probably high clearance of sodium ions during the observation period. Mesor was 0, $b \pm 0.15$ ml / 2 h and exceeded 500% of control animals. An average daily level of rhythm of proximal transport of sodium ions in all studied periods of the day was lower than in the control group of animals, which probably led to the elimination of excess of this cation from blood plasma. Distal transport also decreased at all times of the day. The amplitude of the rhythm increased by 33%, and the mesor decreased by 78% compared with the control data. The phase structure of the rhythm did not change. Summarizing the results of the study, it should be noted that in conditions of constant darkness of the pineal gland changes in the chronostructure of the ion-regulating function of the kidneys are compensatory in nature. In particular, the probable decrease in the average daily level of sodium ion reabsorption, the basal level of proximal and distal transport of sodium ions, which leads to high natriuresis during the entire observation period, attracts attention.

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COGNITIVE DISABILITY IN ESTROGEN-ECTOMIZED AND OLD RATS WITH DEVELOPMENT OF DIABETES MELLITUS

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In recent years, there have been many works dealing with the study of the effects of sex hormones on cognitive function. Clinical studies have found that in menopausal women, the tendency to develop type 2 diabetes will increase, spatial and short-term working memory worsens, and there is a tendency to develop depression. The findings suggest that estrogens are involved in the mechanisms of insulin resistance in tissues, in the synthesis of mediators in the catecholaminergic systems of the brain, but many issues remain unresolved. The aim: to establish the effect of estrogens on the indices of spatial memory in ovariectomized and old rats in the background of development of experimental diabetes.

The study was conducted on 30 adult female rats 4-5 months and 20 months old. The study groups were ovariectomized and experimental type 2 diabetes mellitus with protamine sulfate was simulated. The study of spatial memory was carried out in an eight-sleeved radial labyrinth. Ovariectomy caused deterioration of spatial memory relative to the living control group, and diabetes mellitus aggravated pathological changes.

Our data allow us to draw conclusions about the influence of sex hormones on cognitive functions. Ovariectomy caused a deterioration of spatial memory, and the combination of ovariectomy and diabetes aggravated the pathological process. In older animals, the study found a decrease in spatial memory, and diabetes further aggravated the cognitive function. Changes that occur after ovariectomy indicate involvement of estrogen in the regulation of cognitive functions in the process and indicate the possibility of using estrogens in the treatment of neurodegenerative changes in premature and age-related menopause and in the background of concomitant pathological processes.

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FEATURES OF THE PROTEIN METABOLISM IN THE ADRENAL TISSUES OF IMMATURE RATS WITH HYPOBARIC HYPOXIA DEPENDING ON SEX AND THE FUNCTIONAL ACTIVITY OF THE PINEAL GLAND

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Hypoxia is one of the conditions of usual life style and, at the same time, a factor increasing reactive oxygen species (ROS) level. Structural-functional changes of the adrenal glands as