THE LYMPHATIC SYSTEM UNDER TOXIC HEPATITIS IN THE EXPERIMENT

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There is not enough literature about the state of the lymphatic system of toxic hepatitis, this study attempts to address the topic in more detail.

Research methods. Experiments were carried out on 52 mature white laboratory rats weighing 190-260 g. First group (18 rats) - a control group, second group (34 rats) received 50 % oil solution of CCl4 at 0.3 ml per 100 g of body weight four times in day. After 30 days the animals were taken to the experiment. In vivo under ether anesthesia were recorded from the intestinal lymph lymphatic vessel and blood samples were taken and lymph for biochemical studies. The contractile activity of isolated lymph nodes were studied using conventional techniques on a setup consisting of a chamber vacuum tube and a recording device. The following vasoactive substances were used as stimuli: epinephrine hydrochloride , acetylcholine chloride and histamine dihydrochloride at concentrations of 10 -8M to 10- 3M. The total protein content of urea and creatinine in the lymph and blood plasma was determined by a set of «Bio-Lachema-Test». In blood plasma activity was determined enzymes ALT, AST , bilirubin , thymol by the usual method [Kamyshnikov , 2004]. A histological study of lymph nodes and liver was conducted. The experimental results are processed by variation statistics using Student t-test .

Results and discussion. According to the study, in the second group 30 days after the administration of CCl4 formed a toxic hepatitis in rats that is confirmed by histological and biochemical analysis. Lymph flow thus decreased to 0,18 ± 0,02 ml / h (control 0 32 ± 0,03 ml / hour). Blood pressure in common carotid artery was 90-100 mmHg. The rats in Group 2 with a toxic hepatitis significant lowering total protein content 54,2 ± 3,2 g / l plasma , 32,2 ± 4,2 g / l lymph (control 68,3 ± 2,3, 41,3 ± 3,5). The urea concentration in blood plasma of Group 2 rats decreased from 8,2 ± 0,2 to the control 5,4 ± 0,3 mmol / l ($p < 0.01$) , creatinine 67,2 ± 3,1 to 51,8,6 ± 4,3 ($p < 0.01$) mmol / l, and the lymph urea decreased from 8,6 ± 0,7 (control) to 6,7 ± 0,3 (p <0, , 01) mmol / l creatinine to 80,5 ± 4,3 65,2 ± 3,2 mmol / l ($p < 0.01$). Total bilirubin in plasma was increased by 20% and thymol for 65 % of the control level . In rats with toxic hepatitis ALT levels increased by 445 % and AST by 252 % compared to the control group . These data show the development of toxic hepatitis in the rats of the second group. It is believed that the total bilirubin in the blood of toxic hepatitis increases usually in the later stages of the liver dysfunction . The number of leukocytes increased by 36%, erythrocytes - 34.7% , platelets - 83 % from the control group data. Hemoglobin level was lowered. The clotting time of blood and lymph is shortened , and the viscosity increased by 29%. Contents of sodium and potassium in the blood plasma and urine decreased . In the lymph their content increased.

Experiments show that phase rhythmic contraction were recorded on mesenteric lymph knots. In intact rats, spontaneous contractions observed isolated mesenteric lymph nodes frequency 5,0 ± 0,2 abbr. / Min and amplitude - 7,2 ± 0,7 mg . Toxic hepatitis frequency of contractions in the mesenteric nodes was equal to 1,3 ± 0,2 abbr. / Min and amplitude - 1,2 ± 0,3 mg . Contractile responses were recorded under the action of vasoactive substances on the nodes. In intact rats at doses of epinephrine solution (10-8-10- 3M) under the action of the mesenteric lymph nodes induced contractile response as reaction rate with increasing frequency of 47 ± 1,4% and the amplitude of 29 ± 1,0%. Similar reactions induced acetylcholine (10-8-10- 3M). Under the action of histamine on the mesenteric nodes Incidence rate by 32 ± 1,2% and amplitude by 27 ± 0,9%. As seen from our data, when toxic hepatitis is present motor function lymph nodes are strongly inhibited and their sensitivity is reduced to the action of vasoactive substances. Contractile responses units to the action of vasoactive substances against tonic slow waves in the vast majority of the experiments contained no rhythmic contractions.

Under the action of adrenaline (10-9-10-3M) response contractile responses mesenteric lymph nodes were observed in 33% of the experiments, under the action of acetylcholine (10-9-10-3M) - 28% of histamine (10-9-10-3M) - 30%. In other experiments there was no reaction.

According to the literature [Melin et al., 2001], when CCl4 is exposed to animals the synthesis of the protein in the liver breaks down and decreases the conversion process of ammonia to urea, as CCl4 affects the structure and function of hepatocytes. It is believed that the decrease in total protein content in blood plasma and lymph rats is due to a decrease in protein synthesis in the liver, changes elektrlitnogo balance in the body in biological fluids, as well as action membranotoksicheskim CCl4, which reduces the change in the lymph and the lymph nodes dynamics. Our previous studies [Ahmetbaeva, Demchenko, 2008] showed that CCl4, inhibiting the adrenergic and cholinergic innervation of all the vessels of the abdominal cavity, including the lymph reduces lymphodynamics parameters. Thus, the lymphatic system is involved in the pathological process of toxic hepatitis, the extent of these violations is directly proportional to the severity of the process.