



Bezrodna Anastasiia

A GENERAL ANALYSIS OF THE INFLUENCE OF XENOBIOTICS ON THE MAIN METABOLIC LINKS OF RATS UNDER THE CONDITIONS OF A SUBACUTE TOXICOLOGICAL EXPERIMENT

Ukraine, Kharkiv
Kharkiv National Medical University
Department of Biological Chemistry
Scientific advisor: prof. O.A.Nakonechna

Introduction: Today in the world xenobiotics are widely used in all industries. Ever-growing range of detergents, modern building materials created the conditions for aggressive penetration into all spheres of human stay, water and also contributes to the emergence of a new ecological pathology in the population of chemical genesis, for which scientists still not defines a complex of pathological symptoms for the human body. Aim – to analyse the influence of xenobiotics on the main metabolic links of rats under the conditions of a subacute toxicological experiment.

Materials and Methods: A subacute toxicological experiment was performed in three groups of animals: a control and two experimental animals in the number of 10 mature (6-8 months) white rats of both sexes of the WAG population in each. Aqueous solutions of polyethylene glycol-400 (PEG-400), polypropylene glycol (PPG) and ethylene glycol (EG) were injected daily intra-gastrically for 45 days at a dose of 1/10 DL 50 with a metal probe. The control group of rats received the corresponding volumes of drinking water. Determination of total protein, albitmins, creatinin, urea, glucose, lactate, cholesterol, triglycerides, insulin, testosterone. estradiol in the blood was performed after the subacute toxification of experimental animals was completed on day 45 of the experiment. The study was carried out on the biochemical analyzer “Lab Line-80”; (Austria) with the help of reagent kits of the firm “Filisit-Diagnostika” (Ukraine). Lactate content in blood serum was determined by the enzymatic colorimetric method. The content of insulin was determined by the method of immunoenzymatic analysis with the help of reagent kits of the company “EIA-2048 Insulin Elisa”; (USA).

Results. It was established that xenobiotics contribute to the development of hypoproteinemia due to hypoalbuminemia, uremia (the urea content increases by an



average of 2.63 times); creatinemia (the creatinine content increased by 91.59 %). Reduced reproductive function of white rats is observed: hypotestosteronemia and hypoestrogenemia. Xenobiotics in doses of 1/10 and 1/100 DL 50 cause a disruption of the carbohydrate metabolism: a decrease in the content of lactate, pyruvate in the background of hypoglycemia (glucose content decreased by 53.51 %, $p < 0.05$). Hypoinsulinemia is detected, which may indicate a malformation of the functioning of the pancreas. The evaluation of lipid metabolism monitoring results under the influence of the studied group of xenobiotics at doses of 1/10 and 1/100 DL 50 revealed hypercholesterolemia and an increase in the content of triglycerides.

Conclusion: It has been established that during the subacute toxicological experiment in rats xenobiotics at a dose of 1/10 DL 50 cause a change main indicators of protein metabolism, causing hypoproteinemia due to hypoalbuminemia, which indicates a violation of the protein-synthesizing function of the liver; a decrease in the content of glucose, lactate, and pyruvate in the blood of the body of experimental groups of rats in comparison with the studied indicators in rats of the control group, which indicates a decrease in metabolic processes and the manifestation of pathological changes in the structural and functional state of the liver, since hypoglycemia and disorders of other metabolic links are inextricably linked with hepatopathology; changes in lipid metabolism, namely an increase in the cholesterol content, which may be associated with an increase in the synthesis of cholesterol in the liver from acetyl-CoA, hormones of steroid nature (sex hormones, corticosteroids), the synthesis of bile acids. An increase in the content of triglycerides in the blood of experimental animals may be associated with impaired functioning of the pancreas and thyroid glands.