

Substantiation of the Regulatory Function of the Use of Local Food Products and Medicinal Plants for Toxic Liver Damage in Experimental Animals

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ABSTRACT--- recent years, the development of horticulture and the production of fruits and vegetables in the Republic of Uzbekistan has focused on the application of innovative technologies in the field of plant protection. Which is achieved through the use of modern technologies used by our gardeners and farmers not only for the production of competitive quality products, but also against pests using chemicals and pesticides. In this regard, the prevention of complications that develops with toxic damage to various diseases of the internal organs, by studying the morphological and functional changes that arise as a result of the effects of these pesticides on the body, especially the respiratory and nervous systems, is of great practical importance for improving and applying pathogenetically substantiated preventive measures. The aim of this work was to evaluate the functional state of the liver by morphological and clinical biochemical studies to assess the degree of structurally functional changes in animals poisoned by Bagira pesticide, as well as by assessing the degree of influence of food and dishes prepared from local food products, additional introduction of the complex into the diet local herbal medicines to the body as a whole. The experiments were carried out on 147 white male rats weighing 170-190 g. Bagira pesticide at a dose of 1/20 LD50 - 44.3 mg / kg (LD50 = 886 mg / kg) was administered daily intragastrically. results of our studies, which show that the use of food prepared from local products together with decoction of medicinal plants in the experiment, showed a sharp improvement in biochemical parameters and functional state of the liver in rats with chronic liver damage with Bagira pesticide, compared with animals that are on the diet of vivarium. Reliable indicators were obtained on increasing the functional capabilities of the liver and the positive effect of new diets on the excretory function of the liver and biliary tract in experimental animals. 1. The use in the experiment of feed prepared from local products together with a decoction of medicinal plants affects the biochemical parameters

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and the functional state of the liver positively, compared with the indicators of animals on the diet of vivarium. 2. An increase in the amount of protein in the liver tissue, a decrease in the activity of ALT and AST of this category of animals indicates an increase in the functional capabilities of the liver, and a decrease in the content of bilirubins indicates their positive effect on the excretory function of the liver.

Keywords--- regional features, food products, local dishes, pesticide, insecticide, medicinal plants, liver

I. INTRODUCTION

The most important way to maintain the normal functioning of the liver is considered a rational diet [4, p. 45; 5, c. 26], however, at present, when organizing dietary nutrition, one of its most important principles, accounting for the food habits of the population, is not fully taken into account [2, p. 83; 6. c. 42].

It should be noted that the bulk of the population in the regions is adapted to dishes of national cuisine prepared from local products [3, p. 25; 7, c. 26]. In addition, to consume European dietary dishes in the regions, people need time to restructure the activity of digestive system enzymes and adapt to new food [8, p. 17].

II. PURPOSE OF WORK

The aim of this work was to study the functional state of internal organs (liver) in experimental animals poisoned with Bagira pesticide to assess the functional state when using food in their diet, along with the additional introduction of a complex of local herbal medicines into the diet.

III. METHODS

The experiments were carried out on 147 white male rats weighing 170-190 g. The studies were carried out in accordance with the European Convention for the Protection of Vertebrate Animals used for experiments or other scientific purposes (Strasbourg, March 18, 1986) ETS N 123. All animals were kept in conditions of the vivarium and the laboratory of biomedical research in hygiene at the Research Institute of the GPPZ of the Ministry of Health of Uzbekistan.

In the first series, animals were divided into 2 groups: 1 control group included animals that received food similar to dishes of national cuisine and prepared from local products (mung bean, peas (nuhat), rice, pumpkin, meat of local animals); Control group 2 - animals included animals that received conventional vivarium feed using buckwheat, barley, oatmeal and imported meat.

Modeling was performed by chronic intoxication in animals of the 2nd series for two months daily, Bagira pesticide was administered intragastrically at a dose of 1/20 LD50 - 44.3 mg / kg (LD50 = 886 mg / kg). Bagira is an insecticide used against pests and diseases of agricultural plants. All experimental animals were divided into 5 groups (from 3 to 7 groups), 21 animals in each group. In the third group, animals received the usual vivarium feed. Animals of the 4th group, poisoned by a pesticide, received food prepared from mash (mashkichiri, mashkhurda) and vegetable broth. The 5th group of animals poisoned by pesticide received food from national dishes with peas (nokhat shurak, mohora) in combination with a decoction of herbal preparations. 6 group of

poisoned animals received national dishes consisting of rice products (pilaf shawl, mastava) and vegetable broth. The 7th group of animals poisoned by pesticide received food from pumpkin and meat (manti from pumpkin and meat) and vegetable broth.

A complex of medicinal plants was introduced (rose hips, licorice root, mint, yarrow) inside the gastrointestinal tract as a decoction at a dose of 1 ml / 100 g of animal body weight. Decoction: 5 g of each plant in crushed form per 400 ml of boiling water was left for 2 hours in a thermos [10, p. 4].

Experimental animals were decapitated after 15, 30, 60 days of experiments in 7 rats, the liver was removed and blood was collected in a centrifuge tube. In this case, the content of total protein in the liver tissue, the activity of the enzymes AST and ALT, the amount of total and direct bilirubin in the blood serum were studied [10, p.4].

Table 1: The state of some biochemical parameters in the liver of white rats poisoned with Baghir pesticide and receiving vivarium feed and diet from national dishes, $M \pm m$

Series	Groups	General protein (mg / g)	AST (mmol / gh)	ALT (mmol / gh)	Serum Bilirubin ($\mu\text{mol} / \text{l}$)	
					overall	direct
15 день опыта						
I	1. Control-1 (use of national dishes) –K1	73,23±1,45	60,62±3,32	37,20±1,92	18,99±1,03	0,51±0,03
	2. Control-2 (vivarium feed) - K2	70,07±1,47	61,33±1,55	35,93±1,99	22,31±3,06	0,55±0,07
II	3. Pesticide + feed vivarium-Op1	61,4±0,71***	77,7±1,36***	68,3±1,33** *	32,2±1,1** *	0,68±0,03* **
	4. Pesticide + treatment + dishes from Masha + decoction-Op2	66,01±1,55**	62,8±2,19	33,53±2,12	22,48±1,29	0,45±0,03
	5. Pesticide + treatment + pea dishes + broth-Op3	65,96±1,52**	58,83±2,25	33,68±2,0	21,43±2,90	0,56±0,03
	6. Pesticide + treatment + rice dishes + broth-Op4	63,68±1,29** *	55,29±1,74	34,84±1,78	22,28±1,13	0,55±0,002

	7. Pesticide + treatment + dishes with pumpkin imyas + broth-Op5	62,68±1,26** *	55,87±1,94	32,29±1,51	22,61±1,33	0,56±0,02
30 day experience						
I	1.K ₁	75,2±2,12	62,4±1,29	35,0±2,02	17,7±1,02	0,93±0,11
	2.K ₂	68,99±1,68*	60,4±1,24	42,0±1,02**	20,07±1,02	0,97±0,06
	3.Op1	53,2±1,06***	81,8±2,06***	62,0±1,07** *	29,55±3,07**	1,33±0,04* *
II	4.Op2	69,76±1,89	59,7±1,21***	38,0±2,02** *	21,3±1,14*	1,04±0,07*
	5.Op3	70,27±1,93	62,0±1,23	36,0±2,02** *	22,1±1,02*	1,16±0,05* *
	6.Op4	69,56±2,20	59,8±1,17	34,0±2,32** *	19,8±1,02*	1,14±0,10*
	7.Op5	71,84±2,03	59,7±1,20	35,0±0,01	22,1±1,01*	1,10±0,07*

60 day experience						
I	1.K ₁	75,2±2,12	62,4±2,29	55,0±1,02	17,7±1,02	0,93±0,11
	2.K ₂	65,64±2,88*	52,8±2,19*	60,6±2,04	19,6±1,02	1,02±0,09
	3.Op1	53,2±1,07** *	81,8±2,06***	92,4±2,07** *	31,3±1,07**	1,73±0,04* **
II	4.Op2	73,56±1,9	58,8±1,28	56,0±1,03	22,4±1,02*	1,03±0,10
	5. Op3	76,01±2,34	51,8±1,26*	55,6±1,04	21,8±1,02*	1,07±0,07
	6. Op4	67,49±2,49	49,7±1,23**	59,7±2,04	20,6±1,02* *	0,97±0,06
	7. Op5	74,79±2,41	51,0±1,28**	60,3±2,03	19,4±1,02* *	1,01±0,07

Reliability in relation to the group Op1: * - P < 0,05; ** - P < 0,01; *** P - < 0,001.

IV. RESULTS

Analysis of the obtained results and study indicators on the 15th, 30th and 60th day of the experiment of the functional state of the liver of the animals studied, and their indicators are presented in the table.

The use of Bagira pesticide in animals and the use of conventional products (Op1) in animal feeding on the 15th day of the experiment showed significant changes in the studied parameters compared to K1 and K2: the amount of total protein in the liver tissue decreased by 12.5%, AST activity increased 28.2%, ALT - by 83.6%, the

content of total bilirubin in blood serum increased by 44.3%, direct bilirubin - by 33.3%; in all cases, these differences were statistically significant: $P < 0.05$ - $P < 0.01$. On the 30th and 60th day of the experiment, the studied indicators of the functional state of the liver also significantly differed from those of healthy animals: the amount of protein was 29.2% lower, the activity of ALT was 77.1-68.0%, AST was 31.1-31, 0% higher, the total bilirubin content is 66.9 - 76.8%, and direct bilirubin is 43.0 - 86.0% more than in K1 and K2 ($P < 0.05-0.001$). Which indicate a sharp decrease in the functionality of the liver.

The inclusion in the menu of experimental animals of local food products (groups Op2, Op3, Op4, Op5) by the 15th day allowed to improve performance; the amount of protein compared to Op1 increased with the introduction of dishes from mash and peas by 7.5%, from rice and pumpkin - by 2.6%; AST activity decreased by 19.2-24.3%, ALT by 38.7-45.2%, total bilirubin content by 25.8-33.0%, and direct bilirubin content by 17.6-19.1%. However, not in all cases the indicated changes were statistically significant; in particular, a significant increase in protein in the liver tissue was noted only when mash and pea were included in the diet of rats (Op2, Op3,). In the control groups, different foods were used for feeding healthy animals, and although the studied functional indicators have some differences, in no case were these differences reliable.

On the 30th day of the experiments, the influence of national dishes on the functional state of the liver was more pronounced: the amount of protein compared to Op1 increased with the introduction of all dishes, but it was especially noticeable with peas and pumpkin with meat, respectively, by 31.15 and 35.0% ($P < 0.001$), AST activity decreased by 24.2-27.0%, ALT - by 38.7-45.2%, total bilirubin content - by 25.2-33.0%, and direct bilirubin - by 14.3-27.8% (P in most cases < 0.01).

The indicators in the liver tissue of animals Op2, Op3, Op4, Op5 - groups on the 60th day of the experiments, most of the studied, it seemed at the level of healthy control animals.

V. CONCLUSION

1. The use of adapted feed prepared from local products and the use of decoctions of medicinal plants, allows the improvement of biochemical parameters and the functional state of the liver compared with indicators of animals on the diet of vivarium.

2. An increase in the functional capabilities of the liver is manifested in increases in the amount of protein in the liver tissue, a decrease in the activity of ALT and AST when using local products, and on turnover and a decrease in the content of bilirubins, the bile excretory function of the liver has a positive effect.

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