

## CLINICAL EFFICACY OF PHOSPHOLIPID-CONTAINING PREPARATIONS OF DIFFERENT ORIGIN UNDER EXPERIMENTAL GASTROENTEROPATHOLOGY IN MICE

**V. A. Gryshchenko**, *Doctor of Veterinary Sciences, Professor,*  
*Department of Animal Biochemistry and Physiology named after Academician M. F. Gulyi*  
<https://orcid.org/0000-0001-6601-1392>  
*National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine*  
*E-mail: [viktoriya\\_004@ukr.net](mailto:viktoriya_004@ukr.net)*

**J. Illek**, *Associate Professor MVDr., DrSc., Dipl. ECBHM, Professor,*  
*Faculty of Veterinary Medicine, Large Animal Clinical Laboratory*  
<https://orcid.org/0000-0002-1374-7918>  
*University of Veterinary Sciences Brno, Brno, Czech Republic*  
*E-mail: [illekj@vfu.cz](mailto:illekj@vfu.cz)*

**V. A. Tomchuk**, *Doctor of Veterinary Sciences, Professor,*  
*Department of Animal Biochemistry and Physiology named after Academician M. F. Gulyi*  
<https://orcid.org/0000-0003-0622-6345>  
*National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine*  
*E-mail: [tomchuk\\_viktor@ukr.net](mailto:tomchuk_viktor@ukr.net)*

**Abstract.** *Diseases of the digestive system are extremely common among animals, especially young animals. The purpose of this work was to determine the features of the corrective effectiveness of reparative agents based on phospholipids of various origins based on the results of a comprehensive study of clinical, hematological, immunological parameters and the structural and functional state of immunocompetent organs in CBA mice with experimental gastroenteropathology.*

*As a result of the reproduction of an acute form of hemorrhagic gastroenteritis with diarrheal syndrome in CBA mice, the development of characteristic clinical symptoms was noted. Regardless of the nature of the origin of phospholipids, preparations based on them exhibited a pronounced reparative effect on cell damage. At the same time, the effectiveness of the dietary supplement "FLP-MD" based on phospholipids from milk according to some indicators turned out to be better than the preparation Essentiale-forte based on phospholipids from soybeans. Thus, the peculiarity of the effect of the dietary supplement "FLP-MD" on the organism of sick mice is the acceleration of the restoration of the general clinical state of the animals (on the 8-10th day from the beginning of the introduction of the dietary supplement into the body versus the 10-12th day when using the drug essentiale-forte), restoration of the mass of lymphoid organs (thymus and spleen); an increase in the relative number of T-lymphocytes in the blood by 1.4 times due to the activation of proliferative processes in the organs of the immune system (4.8 times in the spleen, 1.5 times in the thymus).*

**Keywords:** *experimental gastroenteropathology, laboratory mice of the CBA line, clinical, hematological, immunological, microscopic studies, phospholipids from milk and soy, correcting efficiency*

### Introduction

Animal gastroenteropathology remains the most common group of diseases of the digestive system, prompting the development of effective drugs and the introduction of new therapeutic regimens. Animals of all species and age groups are affected, but more often young animals (Sato, 2010). More and more attention is paid to the intensive correction of structural and functional disorders of organs and tissues damaged during the development of gastroenteropathology (Szabo et al., 2007; by Abdel Khalek et al., 2012; Tomchuk, V. et al., 2019).

In clinical medicine, the leading role in the development of a severe course of diseases of the digestive, nervous and cardiovascular systems, disorders of the structural organization of the lipid bilayer of membranes and the effectiveness of the use of reparative drugs for its restoration has already been proven (Bothra et al., 2018; Leskova et al., 2020). Among such agents, phospholipid-containing drugs occupy a leading place (Harvey & Cave, 2014; Yang et al., 2018; Gryshchenko, 2020). The membrane stabilizing and protective action of phospholipids is achieved by their direct incorporation into the phospholipid structure of damaged cell membranes, replacing defects and restoring the barrier function of their lipid bilayer.

Exogenous phospholipids promote the activation of phospholipid enzymes located in the membrane, and significantly support intracellular metabolism. The protective action of these compounds is also based on the inhibition of lipid peroxidation, which is considered one of the leading pathogenetic mechanisms of organ and tissue damage (Solís-Calero et al., 2015; Colombo et al., 2018; Gryshchenko et al., 2018).

Phospholipids, which are part of modern medicines, mainly of plant origin and obtained from soy. However, they differ in their chemical structure from the phospholipids of the cell membranes of the human and animal body. Therefore, the idea arose to create a bioadditive of reparative action ("FLP-MD") based on phospholipids of animal origin, namely from milk, which in their chemical structure correspond to such lipid components of mammalian cell membranes.

### **Analysis of recent research and publications**

High clinical efficacy, almost complete absence of contraindications to the use and non-toxicity of phospholipid drugs contributed to their intensive use in the practice of phthisiatric, pulmonary surgical, cardiological and intensive care units, as well as in gastroenterology for the correction of functional disorders of the liver and organs of the gastrointestinal tract in humans (Bothra et al., 2018; Colombo et al., 2018; Zhang et al., 2018). Thus, in gastroenteritis, regardless of the etiology of the onset of the disease, there is a violation of the structural organization of the epithelial layer of the mucous membranes of the digestive tract, primarily, this concerns the plasmolema of epithelial cells (Deng et al., 2009; Qingbiao et al., 2014). Therefore, in clinical practice, it is advisable to use drugs that stimulate reparative processes, and their active substances easily penetrate the cell membranes of the digestive organs and show tropism to cell membranes (primarily, drugs based on phospholipids and essential fatty acids). There are practically no therapeutic and prophylactic agents with a reparative effect on the market of veterinary drugs. Thus, the use of reparative phospholipid-containing drugs in veterinary medicine requires detailed study and is relevant.

The aim of this work is to determine the features of the corrective effectiveness of reparative agents based on phospholipids of various origins based on the results of a comprehensive study of clinical, hematological parameters and the structural and functional state of immunocompetent organs in CBA mice with experimental gastroenteropathology.

### **Materials and methods of research**

The studies were carried out on sexually mature mice of both sexes of the CBA line breeding the vivarium of the Ukrainian Research Institute of Oncology and Radiology of the Ministry of Health of Ukraine, laboratory studies were carried out on the basis of the laboratory of the Research Department of Clinical Immunology of this institute. For the experimental reproduction of the acute form of gastroenteropathology in mice, the following model was used: during the first five days, the drug Guttalax was administered per os once a day at a dose of 0.75 mg/kg of body weight, and then, for two days, an aqueous solution of diclofenac was administered per os dose of 25 mg/kg body weight (Melnychuk, 2008). This model corresponds to the development of hemorrhagic gastroenteritis with diarrheal syndrome. After the reproduction of gastroenteropathology in laboratory animals, from the eighth day of the experiment, corrective therapy was started in the form of a liposomal form of a phospholipid-containing biologically active additive (BAA) "FLP-MD" (Melnychuk et al., 2009) - 2 g/kg of body weight per day and the drug essentielle-forte for injection – 67 mg/kg of body weight per day, which was administered per os for 30 days.

Experimental groups consisted of ten mice (five of each sex): up to group I included intact animals, to group II - animals in a state of experimentally recreated gastroenteropathology, without treatment (control), in group III - animals in a state of experimental gastroenteropathology using as corrective therapy of essentielle-forte based on soy phospholipids, in group IV mice were in a state of experimental gastroenteropathology, which underwent correction of dietary supplements "FLP-MD" based on milk phospholipids. The main phospholipids of the membranes of milk fat globules are phosphatidylcholine, phosphatidylethanolamine and sphingomyelin, which account for more than 80% of the total lipid phosphorus. Phosphatidylserine, phosphatidylinositol and lysophospholipids are contained in globules in small and unstable amounts. The fatty acid composition of neutral and polar lipids of the membranes of fatty globules of milk is mainly represented by palmitic, stearic, oleic and linoleic acids, which make up 84-90% of all fatty acids.

Changes in the general condition of the animals, dynamics of body weight, appetite, behavior, the amount of food consumed and mortality were monitored. After the end of the experiment (on the 37th day from the beginning), the mice were decapitated under ether anesthesia. Blood samples were taken from these

animals for hematological and immunological studies, the weights of the thymus and spleen, thymus and spleen indices (the ratio of organ weight (mg) to animal body weight (g), the number of lymphoid cells in the indicated immunogenesis organs) were determined. Microscopic examination Pieces of tissue were fixed in 10% formalin solution, and their sections were stained with hematoxylin-eosin.

The morphological study of the peripheral blood of the experimental animals included the preparation of smears, which were stained according to Romanovsky-Giemsa, to display the leukogram.

Thymic endocrine function was assessed by serum thymic factor (TSF) levels (Bach & Dardenne, 1973). The content of T-lymphocytes in the peripheral blood of mice was determined by the method of spontaneous rosette formation (E-ROK), which is based on the determination of the presence of receptors on the surface of T-cells for rabbit erythrocytes (Nicoletti et al., 1991).

A suspension of thymus and spleen cells was used to study spontaneous apoptosis and proliferation. We used a T-cell mitogen – phytohemagglutinin (PHA), which was used to activate splenocytes and thymocytes. The DNA content in cells was assessed by the protocyotometric method (FACScan "Becton Dickinson" USA device) after staining with a fluorochrome (propidium iodide), selectively binds to DNA in the cell nucleus (Moorhead, 1970). The index of proliferative activity (IPA) was determined by dividing the percentage of cells in the proliferative pool by the percentage of cells in a state of apoptosis.

The experimental data were statistically processed using the STATISTICA 5.0 software package (Stat Soft, USA) using Student's criteria with normal distribution. Differences between the data were considered significant at  $P < 0.05$ .

## **Results of the research and their discussion**

From the first days of the reproduction of the acute form of gastroenteropathology in mice of the CBA line of research groups, the development of clinical symptoms of gastroenteropathology is noted: decreased mobility, depression of the general condition, exhaustion and loss of appetite, rarefied (creamy) consistency of feces. The severe form of this pathology is characterized by a high percentage of mortality in mice (84%), which decreases to 50% when using *essentiale-forte*, and when using dietary supplements "FLP-MD" - up to 8%.

The disappearance of the described clinical symptoms in experimental animals subject to self-rehabilitation (group II, control) is noted only on the 30th day of observation.

At the same time, in mice of the III group, the recovery of the level of food consumption was noted on the 2nd day of the rehabilitation period. An improvement in the clinical state of the animals was recorded on the 4-5th day from the start of the drug *essentiale-forte*, and on the 10-12th day, the behavior of these animals did not differ from that of intact mice. The increase in body weight in males was established on the 13th day, and in females much later, on the 30th day of administration of this drug.

In animals of group IV, a significant improvement in the functional state of the body - an increase in mobility and restoration of appetite was noted on the 3rd day from the beginning of the use of dietary supplements "FLP-MD". Already on the 8–10th day of the experiment, the behavior of these animals did not differ from the mice of group I. An increase in body weight was established in mice: in males after the seventh day from the beginning of the introduction of correction therapy, and in females on the 30th day of the experiment. The body weight in animals of the control group remained unchanged throughout the observation period.

The results of the study of hematological parameters in experimental CBA mice are presented in Table. 1.

As can be seen from the data obtained, in animals of group II in the peripheral blood, the number of erythrocytes and the content of hemoglobin does not differ from the level of intact animals, but the ESR significantly decreases. In animals of this group, there is also a decrease in the number of leukocytes by 35%, primarily in the relative and absolute number of monocytes (3.5 times) and segmented neutrophils (2.4 times).

After the application of corrective therapy in the form of *essentiale-forte* and the "FLP-MD" dietary supplement, a significant decrease in the level of hemoglobin in the blood was found in comparison with that in animals of groups I and II. This is probably due to the discrepancy between the intensity of the processes of erythrocytopoiesis and hemoglobin formation. The value of ESR in the group of animals receiving dietary supplements "FLP-MD", significantly increased, which may be due to an intensive increase in the mass of erythrocytes in the blood. The use of both *essentiale-forte* and the "FLP-MD" dietary supplement in experimental mice was accompanied by a significant decrease in the absolute number of monocytes (by 58%) in the peripheral blood of group III animals and in the relative blood by 2.6 times in

group IV mice.

**1. Hematological parameters and the number of T-lymphocytes in the peripheral blood of experimental CBA mice (M ± SD, n = 6-8)**

Index		Group of mice			
		I	II	III	IV
Erythrocytes, ×10 <sup>12</sup> /L		6.16 ± 0.91	6.77 ± 0.88	7.72 ± 0.49	7.50 ± 0.23
Hemoglobin, g/L		128.00 ± 6.58	130.0 ± 2.00	115.00 ± 2.91**	110.33 ± 3.93***
Hematocrit, L/L		0.52 ± 0.03	0.49 ± 0.01	0.46 ± 0.02	0.48 ± 0.02
ESR, mm/hour		1.13 ± 0.13	0.05 ± 0.01*	1.00 ± 0.01**	1.38 ± 0.24**
Leukocytes, ×10 <sup>9</sup> /L		4.32 ± 0.35	2.80 ± 0.25*	2.75 ± 0.36*	3.70 ± 0.39
Rod neutrophils	%	0.38 ± 0.06	0.50 ± 0.10	0.13 ± 0.03	0.58 ± 0.10
	×10 <sup>9</sup> /L	0.014 ± 0.003	0.010 ± 0.002	0.003 ± 0.0001	0.020 ± 0.003
Segmented neutrophils	%	20.75 ± 3.07	16.25 ± 3.75	23.50 ± 3.38	15.50 ± 1.80
	×10 <sup>9</sup> /L	0.887 ± 0.082	0.377 ± 0.043*	0.585 ± 0.081	0.580 ± 0.087
Eosinophils	%	4.44 ± 0.54	4.00 ± 0.70	5.25 ± 0.93	3.58 ± 0.55
	×10 <sup>9</sup> /L	0.166 ± 0.036	0.096 ± 0.014	0.163 ± 0.037	0.131 ± 0.030
Monocytes	%	5.25 ± 0.97	2.00 ± 0.07*	3.00 ± 0.34	2.00 ± 0.37*
	×10 <sup>9</sup> /L	0.196 ± 0.025	0.056 ± 0.011*	0.082 ± 0.012*	0.185 ± 0.031
Lymphocytes	%	69.00 ± 3.44	77.00 ± 9.00	68.13 ± 4.49	78.25 ± 2.06*
	×10 <sup>9</sup> /L	2.962 ± 0.246	2.270 ± 0.270	1.917 ± 0.124*	3.215 ± 0.436
T-lymphocytes	%	6.63 ± 0.88	8.00 ± 1.00	8.50 ± 0.76	9.00 ± 0.20*
	×10 <sup>9</sup> /L	0.25 ± 0.03	0.19 ± 0.04	0.16 ± 0.03	0.26 ± 0.05

**Notes:** 1.\*The difference is significant compared with the values in the group of intact animals (I), P < 0.05; 2.\*\* The difference is significant in comparison with the values in the control (II) group of animals, P < 0.05.

The introduction of preparations based on phospholipids of both plant and animal origin did not significantly affect the number of lymphocytes in sick mice compared to the control group of animals (without treatment). At the same time, the introduction of dietary supplements "FLP-MD" into the body of sick animals increased the relative number of these cells by 1.4 times, and the use of essentielle-forte resulted in a decrease in the absolute number of lymphocytes (by 35%) compared to the animals of the intact group. At the same time, the number of T-lymphocytes in the blood significantly increased 1.4 times in comparison with intact animals only in group IV mice.

So, the modeling of gastroenteropathology in CBA mice is associated with a decrease in the peripheral blood ESR value and the number of leukocytes, mainly due to segmented neutrophils and monocytes. The correction of structural and functional disorders of the epithelial cells of the digestive tract with the use of dietary supplements "FLP-MD", in contrast to the drug essentielle-forte, was accompanied by an increase in the relative number of lymphocytes, a decrease in the peripheral blood hemoglobin content and an increase in ESR intensity, which occurred against the background of a tendency to increase the number of red blood cells.

As a result of the study of indicators of the general state of the organs of the immune system in experimental animals, it was found that the modeling of gastroenteropathology in mice (group II) is accompanied by a significant decrease in the mass of the thymus and spleen in comparison with intact

animals (Table 2). At the same time, the animals of this group showed a significant 45.5% decrease in the absolute number of lymphoid cells in the spleen as compared with the group of intact animals.

## 2. Indicators of the general state of the lymphoid organs of the immune system in experimental mice ( $M \pm SD$ , $n = 6-8$ )

Index		Group of mice			
		I	II	III	IV
Thymus mass, mg		$53.38 \pm 4.38$	$37.00 \pm 5.00^*$	$48.25 \pm 6.44$	$43.57 \pm 6.61$
Thymus index		$2.26 \pm 0.32$	$1.55 \pm 0.35$	$2.09 \pm 0.18$	$2.11 \pm 0.35$
Spleen weight, mg		$110.38 \pm 5.05$	$78.00 \pm 8.00^*$	$97.50 \pm 9.08$	$121.29 \pm 16.44$
Splenic index		$4.65 \pm 0.31$	$3.50 \pm 0.59$	$4.00 \pm 0.40$	$5.61 \pm 0.85$
The number of lymphoid cells in the thymus	$\times 10^6$	$47.88 \pm 8.37$	$56.00 \pm 7.09$	$53.63 \pm 9.97$	$59.13 \pm 6.46$
	$10^6/\text{mg}$	$0.533 \pm 0.098$	$0.709 \pm 0.060$	$0.612 \pm 0.061$	$0.590 \pm 0.092$
The number of lymphoid cells in the spleen	$\times 10^6$	$178.75 \pm 17.00$	$97.50 \pm 16.50^*$	$163.75 \pm 18.15$	$233.75 \pm 19.05^{*,**}$
	$10^6/\text{mg}$	$1.70 \pm 0.04$	$1.19 \pm 0.26$	$1.66 \pm 0.34$	$2.24 \pm 0.39$

Notes: 1.\*The difference is significant compared with the values in the group of intact animals (I),  $P < 0.05$ ; 2.\*\* The difference is significant in comparison with the values in the control (II) group of animals,  $P < 0.05$ .

The use of essentielle-forte and the "FLP-MD" dietary supplement is accompanied by the restoration of these indicators to the level of intact animals and did not significantly affect other indicators of the general state of the immune system organs, with the exception of the possible increase in the number of lymphoid cells in the spleen in animals of group IV compared to animals control and intact groups, respectively, by 2.4 and 1.3 times.

The results of the study of the endocrine function of the thymus indicate its significant inhibition in the process of modeling gastroenteropathology in laboratory mice. The use of essentielle-Forte in sick animals is accompanied by a significant increase in the endocrine function of the thymus, as a result of which the TSF level increases by 3.0 times, and the administration of dietary supplement "FLP-MD" to sick mice suppresses it (the TSF level decreases 2.0 times) relative to group II mice. The latter probably occurs due to the development of a stress reaction (immobilization stress), which can be caused by four times a day administration of dietary supplements (as opposed to a single use of essentielle-forte), since it is known that activation of the glucocorticoid function of the adrenal cortex is accompanied by inhibition of endocrine function. thymus [8], and with it the function of T-lymphocytes, which are a target for hormone antagonists.

Physiological death of lymphoid cells in the organs of immunity occurs through apoptosis (Nicoletti, 1991). However, a high degree of cell death, including in the thymus, is compensated by intense proliferation. It is she who determines the filling of the organs of the immune system with cells. Thus, the combination of the processes of proliferation and apoptosis of cells of the immune system is an important means of selecting their clones and is the basis for controlling the regularity of differentiation of T- and B-lymphocytes, the formation of an immune response and the implementation of the body's immunological defense (Udut et al., 2013).

The study of the processes of proliferation and apoptosis of lymphoid cells of the thymus and spleen of mice of different groups showed that during self-rehabilitation (group II) in mice, the processes of programmed death and proliferation of these cells are somewhat slowed down (Table 3).

## 3. The level of spontaneous and PHA-induced apoptosis and proliferation of lymphoid cells of the central organs of immunity in experimental CBA mice, % ( $M \pm SD$ , $n = 6-8$ )

Index	Group of mice
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		I (control)	II	III	IV
Splenocytes	Apoptosis	2.20 ± 0.36	0.57 ± 0.19*	0.72 ± 0.16*	0.70 ± 0.15*
	Proliferation	17.15 ± 1.18	15.10 ± 2.03	18.74 ± 2.40	26.38 ± 3.75***
	IPA	7.80 ± 1.07	26.49 ± 1.38*	26.03 ± 1.32*	37.69 ± 1.71***
Thymocytes	Apoptosis	1.70 ± 0.40	0.98 ± 0.05	1.09 ± 0.22	1.18 ± 0.18
	Proliferation	29.03 ± 1.09	25.46 ± 0.65*	28.84 ± 0.89**	30.22 ± 1.04**
	IPA	17.08 ± 2.69	25.98 ± 1.82*	26.46 ± 2.54*	25.61 ± 2.03*
Splenocytes + PHA	Apoptosis	69.90 ± 5.19	71.04 ± 1.60	72.24 ± 2.95	72.89 ± 5.69
	Proliferation	38.59 ± 2.79	33.25 ± 2.16	35.26 ± 4.00	44.22 ± 2.13**
	IPA	0.55 ± 0.08	0.47 ± 0.02	0.49 ± 0.09	0.61 ± 0.06**
Thymocytes + PHA	Apoptosis	49.60 ± 4.16	45.08 ± 2.33	39.78 ± 2.04	42.17 ± 3.70
	Proliferation	28.73 ± 3.36	19.87 ± 2.80	19.86 ± 1.34*	24.55 ± 3.15
	IPA	0.58 ± 0.08	0.44 ± 0.02	0.50 ± 0.04	0.58 ± 0.09

Notes: 1.\*The difference is significant compared with the values in the group of intact animals (I),  $P < 0.05$ ; 2. \*\* The difference is significant in comparison with the values in the control (II) group of animals,  $P < 0.05$ .

Thus, the level of spontaneous proliferation of splenocytes and thymocytes in mice of the control group is equivalently reduced by 1.1 times compared with the group of intact animals. Correction with both essentielle-forte and "FLP-MD" dietary supplement does not significantly affect the intensity of apoptosis, but stimulates proliferative processes in the lymphoid cells of the thymus and spleen, which is especially pronounced in animals of group IV (the intensity of proliferation of splenocytes and 1.1 times thymocytes compared to control). The IPA value also undergoes corresponding changes in animals of group IV, namely: in the spleen it increases 4.8 times compared with the group of intact animals and 1.4 times in relation to the control group (on self-rehabilitation), and in the case of the thymus it increases 1.5 times relative to its values in the group of intact animals.

Thus, the ratio of proliferation and apoptosis processes is an important indicator of the functional state of the body's immune system. The use of corrective therapy in the form of dietary supplements "FLP-MD" causes the activation of proliferative processes in the organs of the immune system, especially in the spleen.

In addition, the results of microscopic studies indicate that guttalex in combination with diclofenac causes changes mainly in the stomach and depending on the sex of animals: in males, necrosis of the mucous membrane, and in females, dystrophic changes (vacuolar dystrophy) of epithelial cells in the glands of the cardiac region predominate. These drugs cause an active reaction of lymphoblasts and the differentiation of the latter into plasma cells, which indicates the presence of antigenic factors in the body of these animals. The use of essentielle-forte as a corrective therapy leads to active proliferation of epithelial cells in the glands of the stomach and hyperplasia of smooth muscle nuclei in males.

After the use of dietary supplements "FLP-MD" only in the esophagus of males there are dystrophic changes in the nuclei of squamous epithelium, while no morphological changes were revealed in the stomach. In females, the introduction of dietary supplements "FLP-MD" promotes the unresponsiveness of the cells of the basal layer in the esophagus (absence of mitosis), parenchymal degeneration of epithelial cells of the mucous membrane of the cardiac part of the stomach and active reaction of lymphoblasts and plasma cells in the submucosal layer. In intact animals, the reaction of cricokaryocytes predominates in the axillary layer, which indicates irritation of the surface epithelium by factors of unknown etiology.

### Conclusion and future perspectives

As a result of the reproduction of an acute form of hemorrhagic gastroenteritis with diarrheal syndrome in CBA mice, the development of clinical symptoms of gastroenteropathology was established, which appeared from the first day of the experiment. In particular, this is a decrease in the mobility of animals, suppression of their general condition, exhaustion and loss of appetite, rarefaction of feces and a high percentage of mortality (up to 84%). Disappearance of clinical symptoms of experimental pathology in animals in self-rehabilitation is noted only on the 30th day of observation. They are also characterized by a decrease in the peripheral blood ESR value and leukopenia, mainly due to segmented neutrophils and monocytes. In these animals, a significant decrease in the mass of the thymus and spleen and the absolute number of lymphoid cells in the latter, a significant suppression of the endocrine function of the thymus, was established. In sick mice, the processes of programmed death and proliferation of lymphoid cells are somewhat slowed down. In addition, the results of microscopic studies indicate characteristic changes in the stomach and their dependence on the sex of animals: in males, necrosis of the mucous membrane, and in females, dystrophic changes (vacuolar dystrophy) of epithelial cells in the glands of the cardiac section predominate.

At the same time, the use of reparative therapy agents based on phospholipids of various origins in sick animals produces a pronounced reparative effect. At the same time, the effect of dietary supplements "FLP-MD" is not inferior to the drug *essentiale-forte*. Of the peculiarities of the effect, the introduction of bioadditives into the organism of sick mice deserves attention, the reparative properties are better expressed: a significant acceleration of the restoration of the mass of lymphoid organs; a significant increase in the relative number of T-lymphocytes in the peripheral blood (1.4 times) due to the activation of proliferative processes in the organs of the immune system (the proliferative activity of the thymus increases 1.5 times, and the spleen 4.8 times in comparison with intact animals), as well as a decrease in the time for restoration of the general clinical state of animals (on the 8-10th day from the beginning of the introduction of the supplement into the body versus the 10-12th day when using the drug *essentiale-forte*). Regularities have been established regarding the peculiarities of the effect of phospholipid-containing remedies of corrective therapy of various origins on the organism of laboratory animals with experimental gastroenteropathology, it is recommended to take into account when developing new drugs and appropriate treatment regimens for patients.

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**Грищенко В. А., Іллек Й., Томчук В. А. (2021). Клінічна ефективність фосфоліпідовмісних препаратів різного походження за експериментальної гастроентеропатології мишей.** *Ukrainian Journal of Veterinary Sciences. Хвороби органів травної системи є надзвичайно поширеними серед тварин, особливо в молодняка. Мета цієї роботи полягала у визначенні особливостей корегувальної ефективності засобів репаративної дії на основі фосфоліпідів різного походження за результатами комплексного дослідження клінічних, гематологічних, імунологічних показників та структурно-функціонального стану імунокомпетентних органів у мишей лінії СВА за експериментальної гастроентеропатології.*

*В результаті відтворення гострої форми геморагічного гастроентериту з діарейним*

синдромом у мишей лінії СВА відмічали розвиток характерних клінічних симптомів. Незалежно від природи походження фосфоліпідів, препарати на їх основі виявляли виражений репаративний ефект дії щодо ушкоджених клітин. При цьому, ефективність біодобавки «FLP-MD» на основі фосфоліпідів з молока за окремими показниками виявлялася кращою порівняно з препаратом есенціале-форте на основі фосфоліпідів із сої. Так, особливістю впливу біодобавки «FLP-MD» на організм хворих мишей є пришвидшення відновлення загального клінічного стану тварин (на 8–10-ту добу від початку введення в організм біодобавки проти 10–12-ої доби при застосуванні препарату есенціале-форте), відновлення маси лімфоїдних органів (тимусу і селезінки); збільшення відносної кількості Т-лімфоцитів у крові в 1,4 раза за рахунок активації проліферативних процесів в органах імунної системи (в селезінці у 4,8 раза, в тимусі у 1,5 раза).

**Ключові слова:** експериментальна гастроентеропатологія, лабораторні миші лінії СВА, клінічні, гематологічні, імунологічні, мікроскопічні дослідження, фосфоліпідиди з молока і сої, корегувальна ефективність.