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INFLUENCE OF MEVESEL & E-SELENIUM ON LEVEL OF INTERMEDIATE AND FINAL PRODUCTS OF LIPID PEROXIDATION IN BULLS' BLOOD AFTER CADMIUM LOADING

The level of malonoviy dialdegid and activenew conjugates under the effect of cadmium chloride in toxic doses organism bulls. Found that the development of chronic cadmium toxicity accompanied by increased lipid peroxidation in the blood of young cattle, as indicated by increase in activenew conjugates and malonoviy dialdegid.

Feeding the E-selenium and Mevesel bulls cadmium toxicity in conditions helped reduce the intensity of lipid peroxidation.

***Key words**: toxicology, cadmium chloride, lipid peroxidation, malonoviy dialdegid, activenew conjugates.*

Introduction. In the context of the progression of man-made pollution one of the priorities of toxicology and veterinary medicine is the study of the characteristics and mechanisms of action of the most common toxic substances - heavy metals [1, 2, 3]. One of the harmful chemical elements is cadmium, which when ingested by animals promotes activation of lipid peroxidation [4, 6].

Having established that in the process of cadmium toxicity occur disorders of lipid peroxidation [5, 6], we came to the conclusion that the action of cadmium to suppress excessive free radical reactions in animals, it is necessary to use drugs with a strong antioxidant effect that can inhibit lipid peroxidation. After the large number of antioxidants in cadmium toxicosis calves tested by us, we studied the preventive effect of Mevesel and E-selenium. These antioxidants and block free radical of oxidation prevent the development of stress in animals.

The objective of our research was to establish a prophylactic effect of Mevesel and E-selenium on steers' organisms after cadmium loading.

Material and methods.

Experiments were performed with 15 bull calves of six months age, which were formed in 3 groups of 5 animals in each:

Group 1 -the control group (K), steers were fed with food cadmium chloride at a dose of 0.04 mg / kg body weight of the animal;

Group 2 -the experimental group (G1), steers were fed with cadmium chloride food at a dose of 0.04 mg / kg body weight of the animal, together with E-selenium at a dose of 0.05 ml / kg body weight of the animal. E-selenium in its composition contains vitamin E and selenium.

Group 3 – the experienced group (O2), steers were fed with food at a dose of cadmium chloride, 0.04 mg / kg body weight of the animal with a dose Mevesel 0.36 g / kg of feed. Mevesel in its composition contains vitamin E, selenium and methionine.

The level of malon dialdehyde was determined by the method of E.N. Korobeinikova (1989), the level of diene conjugates was determined by the method of I.D. Stal'noy (1977).

The experiment lasted for 30-days. Blood for analysis was taken from the jugular vein on the 1 -, 8 -, 16 -, 24 - and 30 th day of the experiment.

Results and discussion

Lipids and their natural systems form the basis for constructing biological membranes, in which structure they perform important functions. Lipid oxidation accompanied by a rearrangement of the double bonds in the conjugated diene system. The reactions of lipid peroxidation quite clearly reflect the functional state of cellular and subcellular membranes that are essential for the sustenance of the whole organism. The development of a pathological process is preceded by damage to cell membranes, primarily manifested in violation of the functional state of the lipid layer.There are numerous toxicosis, which are characterized by violation of oxidant- antioxidant balance, including cadmium toxicosis. From previous studies we found that under conditions of cadmium stress in young cattle imbalance between lipid peroxidation and activity of antioxidant system, causing the body accumulates a large amount of free radicals and reactive oxygen species, peroxidation products, which are harmful for body as a whole and as a decrease in the activity of the enzyme and non-enzymatic antioxidant defense

system of the body. Therefore, to correct this balance we used drugs that have antioxidant properties.

We took E - selenium and Mevesel as antioxidants.

Influence of E - selenium and Mevesel on the level of the intermediate products of lipid peroxidation in cadmium toxicosis are shown in Table 1.

Table 1

The level of diene conjugates in the serum of calves after asking Mevesel and E-selenium after chronic cadmium toxicosis (M ± m, n = 5)

Time blood tests (days)	Diene conjugates (mmol / l)		
	Animals groups		
	Control	Exper. 1	Exper. 2
The base line	5,74±0,16	5,80±0,18	5,79±0,15
The first	6,13±0,19	5,97±0,21*	5,82±0,20*
The eighth	7,05±0,20	6,43±0,22*	6,01±0,22**
The sisteenth	7,39±0,30	6,64±0,19**	6,21±0,20**
The twenty-fourth	7,61±0,24	6,12±0,15**	5,91±0,19**
The thirtieth	7,71±0,28	6,03±0,16**	5,77±0,18**

*The degree of reliability as compared with those of the control group in this and the following tables - P <0.05 - * p> 0.01 - ***

As it can be seen from the table the level of diene conjugates in blood of calves, which were asked E-selenium in the first day of the experiment amounted to 5,97±0,21 mmol / l, which is 3% above the initial values and 2,6 % lower than in the control groups of animals. On the eighth day of the experiment the level of diene conjugates in the blood test group animals Ex.1 decreased to 9 % in comparing to the values of the control group animals, on the sixteenth day of the experiment, respectively, decreased to 10%, and on the twenty-fourth day of the experiment the level of diene conjugates was reduced to 20 %. On the thirtieth day of the experiment the level of diene conjugates decreased to 22 % relativing to the control group of animals, which respectively amounted to 6,03±0,16 mmol / l.

The application of Mevesel in the test group animals Ex.2 contributed more likely to reduce the level of diene conjugates than using E-selenium. Indicators of diene conjugates in the blood of animals for the experimental group compared to Ex.1 during the entire experiment were lower. Thus, comparing with the control group animals, the level of indicator, studied on the eighth day of the experiment decreased to 15 %, on the sixteenth day of the experiment to 16 %, on the twenty-fourth day of the experiment to 22 %, respectively. Since the twenty-fourth day of the experiment the level of diene conjugates in blood of experimental calves ranged quantities to physiological norm.

Consequently, the use of E-selenium and Mevesel to animals after cadmium loading prevents making the perekison oxidation of lipid in the blood of animals.

The second important factor is the study of the end products of lipid peroxidation - malondialdehyde. Table 2 shows the change in this indicator in the blood of bulls in chronic cadmium toxicity and the effect of antioxidants preparates: E-selenium and Mevesel.

When fed cadmium chloride to animals at a dose of 0.04 mg / kg body weight of the animal set increase in malondialdehyde from the first day of experience, where in comparison with the original data, it rose to 4.3%. On the eighth day of the experiment the level of malondialdehyde in the blood of these animals was 0,271±0,010 mmol / l. On the sixteenth day of the experiment the level of lipid peroxidation products continued to

grow, and the twenty-fourth day of the experiment, it rose by 26 %, on the thirtieth day – 31 % compared to the original data.

Table 2

Malondialdehyde level in the blood serum of calves after asking Mevesela E and selenium in chronic cadmium toxicosis (M ± m, n = 5)

Time of blood tests (days)	Malondialdehyde (mmol / l)		
	Animals' groups		
	Control	Exper. 1	Exper. 2
The base line	0,235±0,007	0,240±0,008	0,238±0,009
The first	0,245±0,008	0,241±0,010*	0,239±0,010*
The eighth	0,271±0,010	0,258±0,010*	0,250±0,010**
The sixteenth	0,289±0,009	0,255±0,010**	0,246±0,009**
The twenty-fourth	0,296±0,010	0,247±0,010**	0,242±0,008**
The thirtieth	0,307±0,008	0,250±0,009**	0,237±0,010**

The use of E-selenium for steers research group Ex.1 animals help reduce the final product of lipid peroxidation. As it can be seen from the table the level of malondialdehyde in the blood of calves, which asked E-selenium in the first day of the experiment was 0,241±0,010 mmol / l. On the eighth day of the experiment the level of malondialdehyde in the blood test group animals Ex.1 decreased to 4,8 % relative to the values of the control group animals, on the sixteenth day of the experiment, respectively, decreased to 11,7 %, and on the twenty-fourth day of the experiment the level of malondialdehyde decreased to 16 %. On the thirtieth day of the experiment the level of malondialdehyde decreased to 18,6 % relative to the control group of animals, which respectively amounted to 0,250±0,009 mmol / l.

Application Mevesel test group of animals Ex.2 contributed more likely to reduce the level of malondialdehyde than the use of E-selenium. Indicators of malondialdehyde in the animal's blood in comparison with the experimental group Ex.1 during the entire experiment were lower. Thus, comparing with the control group animals, the level indicator, which was investigated on the eighth day of the experiment fell by 7,7 %, on the sixteenth day of the experiment - by 14,9 %, on the twenty-fourth day of the experiment – 18 %, respectively.

It should be noted that the use of animals with chronic Mevesela cadmium toxicosis contributed to a better reduction of the end products of lipid peroxidation.

Conclusions

1. The use of E-selenium and Mevesel in conditions of chronic cadmium toxicity in bulls contributed to the decline of intermediate and final products of lipid peroxidation, diene conjugates and malondialdehyde.

2. If the cadmium load of calves the best effect on the inhibition of lipid peroxidation of animals contributed asking animal drug of Mevesel.

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THE ROLE OF BLOOD PLATELETS IN IMMUNE SYSTEM

Blood platelets are anucleate cells derived from the megakaryocyte series, and have long been considered only as cells responsible for coagulation and the fibrinolysis process. However, recently more data shows that they are also effector cells in the inflammatory response and important elements of the immunological response. Platelets store and release many biologically active substances, including growth factors, cytokines and chemokines, which actively affect i.a. elements of the immune system, and thus become regulators of immunity and mediators of inflammatory response. Their impact on the immune system cells is also associated with the induction of leucocytes and progenitor cells to the site of pathogen permeation or vascular injury inflow, as well as endothelial cells. Interacting with neutrophils, monocytes and lymphocytes, they not only activate them, but also form platelet-leukocyte aggregates that immobilise pathogens and prevent their spreading. Furthermore, platelets are capable of absorbing pathogens, affecting anti-infection immunity of the system. It is also assumed that the presence of receptors on their surface, such as Toll-like receptors (TLRs), affects their initiation and activity of the immunological response.

Key words: *blood platelets, substances of platelets, receptors of platelets, immune system*

Characteristics of platelets. Platelets are anucleate cells derived from the megakaryocyte series, characterised by high morphological variation. Under resting conditions platelets are oval, without cell processes and surrounded with shapeless glycocalyx which prevents their sticking and adhesion e.g. to the endothelium [18, 19]. Their membrane is connected to an intercellular open canalicular system (OCS) which is necessary for their granule content exocytosis which takes part not only in coagulation and homeostasis, but also in inflammation and also activates the immune system [9,14,17,21,23]. The function of platelets during the immunological response is strictly connected with activation of their surface receptors, including the aforementioned TLR markers and the Fc receptor which recognises immunoglobulins G, E and A as well as selectin P and receptor CD40 [1,3,8,9,11,17,21].

The most important receptors of platelets, in relation to immunological response,