



Hematological Indicators under the Influence of Zinc Sulfate in the Experiment

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Abstract: *It is known that the main industrial sources of environmental pollution with heavy metals are numerous industrial emissions from large industrial enterprises, road transport [2,3,4]. Chemical compounds that enter the environment daily fall onto the soil and vegetation cover, as a result of which heavy metals can enter cultivated plants grown in summer cottages in areas adjacent to industrial enterprises. At high concentrations, almost all trace elements can exhibit toxic properties, on which the violation of physiological processes in the body largely depends [1,2].*

Keywords: *physiological processes, body largely, exhibit toxic, summer cottages.*

At present, the study of the functional state of the body in the presence of heavy metals, the use of corrective drugs for therapeutic and prophylactic purposes will achieve a positive therapeutic effect in the toxic effect of xenobiotics is very relevant. [5,6] At the same time, there is an increased interest in the correction of the toxic effect of heavy metals by biological methods, which is associated with their low toxicity and wide distribution in nature.

Blood analysis is an important diagnostic method for various pathological conditions of the body, including heavy metals. Any disease, pathological process, as well as a number of physiological changes can, to one degree or another, affect the quantitative and qualitative characteristics of the composition of circulating blood. This determines the great importance of the need to study blood in toxicological studies [2,3]. In the available literature, there is evidence that chronic intoxication with heavy metal salts reveals a decrease in the level of total protein in the blood plasma, an increase in the amount of sugar. Acute intoxication with copper ions is accompanied by severe hemolysis of erythrocytes [3,4]. In experimental studies, it was found that when animals are inoculated with salts of heavy metals, changes in the blood picture are observed.

However, the effect of the heavy metal zinc on hematological parameters and its correction has not been studied enough. Based on the foregoing, the purpose of this study is to determine the hematological parameters of the blood of white rats during acute zinc inoculation and their correction with coriander.

The experiments were carried out on 21 white outbred rats with an average weight

180-200 gr. The animals were of the same age and kept in a vivarium. Animals were divided into 3 groups.

The first group - control rats (n-4), the second group - animals (n-6), inoculated with intragastric acute doses (LD 50) of zinc sulfate - 100 mg/kg of body weight, the third group consisted of rats (n-5) inoculated with acute doses zinc sulfate against the background of the use of coriander. Blood was taken for general and biochemical analyzes and the hemoglobin content, the number of erythrocytes and leukocytes were determined. The results of a dynamic study of blood analysis in experimental animals revealed that 10 days after acute inoculation with zinc sulfate, significant changes in the composition of the blood were detected. In acute intoxication with zinc salts,



leukocytosis, a decrease in the number of erythrocytes and hemoglobin in the blood were detected. The level of leukocytes significantly increased by the end of the experiment, which indicates an increase in stress in the body due to the toxic effects of heavy metal. A decrease in the number of erythrocytes and a decrease in hemoglobin in the blood of animals indicates an insufficient formation of erythrocytes in the bone marrow, their excessive destruction in organs and peripheral blood during acute poisoning with zinc sulfate.

The use of coriander as a biological corrector achieves a positive therapeutic effect due to the stabilization of cell membranes and antihypoxic action. It brought the level of blood cells closer to the control values, which showed its protective property (Table 1).

Table 1. Changes in hematological blood parameters in laboratory rats with acute seeding with zinc sulfate against the background of the action of coriander

Indicators	Control animals	Animals inoculated with zinc sulfate	Animals after applying coriander	
Hemoglobin	130.85± 3.46	78.98± 11.26	128.40± 3.83	
Erythrocytes	4.28±0.17	3.04±1.04	4.22±0.12	
Color Index	0.82±0.05	0.86±0.05	0.89±0.02	
Leukocytes	7.45±0.10	9.89±0.14	6.11±0.36	
P/I neutrophils	5.00±0.63	2	6.22±0.73	4.03±0.23
S/I neutrophils	57.50±1.87		68.42±1.57	61.38±1.07
Platelets	232.32±1.41	250.0±1.09		242.0±1.06
Eosinophils	2.50±0.55	6.06±1.74		2.68±0.93
Monocytes	2.38±0.89	3.11±1.56		3.21±0.39
Lymphocytes	26.83±1.46	30.78±1.59		33.51±1.25

Thus, a decrease in the content of hemoglobin in the blood is most likely due to the effect of zinc metals in experimental animals, which is consistent with the studies of other authors [5,6], and, therefore, affect hematological blood parameters.

In acute intoxication with zinc sulfate, biochemical indicators showed an increase in ALS and AST, which was shown by inflammatory processes in the liver and kidneys. This is confirmed by our cytomorphological studies, where we noted the formation of malignant atypical epithelial cells in the liver tissue.

Hyperglycemia showed insufficient formation of insulin in the body, which is associated with damage to pancreatic β -cells. An increased content of creatinine in the blood during intoxication was observed, which is associated with a violation of glomerular filtration, damage to the kidney parenchyma. This is confirmed by the data of our cytomorphological studies, where inflammatory phenomena were observed during this poisoning. There was a decrease in the concentration of urea. Since urea (residual nitrogen) is formed in the liver during severe liver damage, the level of urea in the blood decreases (Table 2).



Table 2. Changes in biochemical parameters of blood in laboratory rats during acute seeding with zinc sulfate against the background of the action of coriander

Indicators	Control animals	Animals inoculated with zinc sulfate	Animals after applying coriander
General	40.27±2.18	29.44±1.12.0	37.01±1.79
Glucose	2.49±0.25	3.01±0.58	2.61±0.29
Urea	3.82±0.48	2.13±1.51	3.96±0.72
Createnin	116.85±1.48	182.13±1.78	118.88±1.01
Total bilirubin	33.38±2.39	33.12±1.26	32.31±1.35
Straight	9.02±0.81	9.32±0.31	8.86±0.73
Indirect	22.73±1.70	22.53±1.20	25.49±1.60
ALT	0.88±0.07	0.93±0.03	0.85±0.09
AST	0.77±2.18	0.82±0.03	0.75±0.07

Thus, an increase in ALT, AST, an increase in the content of glucose and creatinine, a decrease in the content of urea in the blood plasma was revealed during acute intoxication with zinc sulfate. In acute poisoning with zinc salts, the protein content in the blood plasma decreased. The observed decrease in the protein content in the blood plasma is associated with the inhibition of the contractile activity of the return of proteins from tissues to the blood.

An increase in ALT, AST, an increase in the content of glucose and creatinine, a decrease in the content of urea in the blood plasma during acute intoxication were revealed. When zinc salts were poisoned, the protein content in the blood plasma decreased. The observed decrease in the protein content in the blood plasma with a simultaneous decrease in plasma volume is associated with a slowdown in the return of proteins from tissues to the blood, which led to a decrease in the concentration of proteins in the blood and its thickening. The action of coriander biocorrector reduced the toxic effect of zinc sulfate.

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