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DETERMINATION OF THE LEVEL OF TOXICITY AND DANGER OF SODIUM FLUORIDE TO THE BODY OF WHITE MICE

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Abstract:
In the scientific article, the level of toxicity and danger caused by the chronic effect of various percentage solutions of sodium fluoride on the body of white mice for 3 months was determined. Accordingly, from the analysis of the data obtained from the experiments, it was determined that sodium fluoride is a substance with high toxicity to the organism of white mice.

Keywords: sodium fluoride, white mouse, poisoning, pathologoanatomical, parenchymatous, mg/l, gram

Enter

Today, with the development of industrial production in all countries of the world cooperation, it leads to a high level of environmental pollution.

Toxicants that pollute the environment to a high degree in the world are mainly heavy metal salts (mercury, lead, cadmium, copper, zinc, margumush), many drugs, pesticides and chemotherapeutic substances, as well as external industrial production waste.

Research object and methods. In accordance with this, we conducted research experiments to determine the degree of toxicity and danger of white mice by chronic exposure to sodium fluoride from fluorine compounds in various percentage solutions. In order to study the level of toxicity of sodium fluoride solution in different doses, laboratory studies were conducted on the basis of "Instructions for toxicological evaluation of chemicals and pharmacological preparations used in veterinary medicine". Pathologoanatomical changes in mice poisoned by sodium fluoride were dissected by evisceration method and studied microscopically.

In order to conduct these research experiments, 35 white mice were taken and divided into experimental and control groups, 5 heads in each group. The average live weight of white mice was 48.5 g. They were active and ate well. The white mice in the experiment were prepared with different percentages of sodium fluoride in

laboratory conditions and drank them daily for 3 months. All white mice in the control and experimental groups were monitored daily. That is, their daily intake of sodium fluoride solution, the general state of the organism in clinical examinations, changes in the gastrointestinal and central nervous systems were taken into account. Body weight of white mice was measured at the beginning and end of the experiment. At the end of the experiment, white mice that received different doses of sodium fluoride solution were dissected for pathological anatomical examinations.

In order to determine the level of toxicity and danger of sodium fluoride to the body of white mice, water containing 0.02 mg/l of sodium fluoride was first given to white mice in the control group, 1.5 mg/l to those in the first experimental group, 15 mg/l to those in the second experimental group, and 50 mg/l to the third experimental group. mg/l, 150 mg/l to the fourth experimental group, 300 mg/l to the fifth experimental group, and 450 mg/l to the white mice of the sixth experimental group. The experiment lasted for 3 months.

Analysis of the obtained results. During 3 months in the experimental group, changes in the internal organs and teeth of white mice that received different doses of sodium fluoride solution were recorded. It was found that increasing the dose of sodium fluoride solution had a negative effect on the viability of white mice.

No significant adverse changes were observed in clinical observations of white mice in the control group. The wool coat was soft, shiny, it consumed food well, no changes were noted in the gastrointestinal tract and central nervous system.

Experimental procedure for studying the toxic effect of sodium fluoride on the body of white mice (n=35)

Groups	Damage amount and method	Number of white mice (at the beginning of the experiment).	Groups Damage Number of white mice (at the end of the experiment)
1- control	0,02 mg/l	5	5
1- experience	1,5 mg/l	5	5
2- experience	15 mg/l	5	5
3- experience	50 mg/l	5	4
4- experience	150 mg/l	5	2
5- experience	300 mg/l	5	1
6- experience	450 mg/l	5	0

The 1 experimental group that received sodium fluoride in the amount of 1.5 mg/l showed that a line was formed in the tooth enamel of the white mice and a high amount of fluorine was accumulated in the tissues. observed. In addition, except for the changes in the teeth of white mice when the amount of fluoride in drinking water was 50 and 150 mg/l, pathogistological changes in internal organs and bones, decreased enzyme activity and deterioration of the general condition of animals, one white mouse from poisoning (50 mg/l), in the next group while (150 mg/l) death from poisoning was caused by cachexia in all three mice.

White mice in the experiment with fluorine in the amount of 300 mg/l in the drinking water showed the above symptoms of acute poisoning and four cases of death were observed, while in the sixth experimental group that received 450 mg/l, it was found that all of the white mice died after a few days of acute poisoning.

Analysis of pathological anatomic examinations. The appearance of the body. The mass of a white mouse is 55 grams, the body is thin, the back fur is smooth, the fur on the belly and chest is sticky. The mucous membranes of the nose and mouth are yellowish-red, the teeth are yellow, the body is not stiff, there is no discharge from the nose, it is dry. The eyes are open, the mucous membranes are reddish in color, there are no discharges from the ears, and the blood vessels are full of blood, there are dotted red spots on the inner membranes of the ears, and the area around the back orifice is dry.

The thoracic and abdominal cavities were opened and the internal organs were removed. The size, shape, color, consistency and cut surfaces of parenchymatous organs were examined.

Chest and abdominal cavities are dry, according to the anatomical arrangement of internal organs. Small dot hemorrhages were detected under the chest. The blood is not coagulated, dark red in color, the subcutaneous muscles are in a state of atrophy. The lungs are bright red. Foci of hemorrhage and hyperemia are formed, hyperemia of blood vessels in the epicardium of the heart, the size of the liver is enlarged, blood clots are formed in the shell of the liver in nutmeg color, blood is visible on the cut surface, the spleen is partially enlarged, there are small point-like hemorrhages in the shell of the kidneys. The consistency is soft, uncoagulated blood is visible on the cut surface, there are signs of inflammation in the thyroid gland.

Foamy food in the stomach, discharge is gray. There are red hemorrhages with reddened inner mucous membranes and dilated blood vessels.

The small intestines are filled with food, the food is yellow in color, and the inner mucous membranes are pale red in color. There is a partial mass of food in the large intestine, the internal mucous membranes are pale red, the caecum is dark red with food, the mucous membrane is light red, blood vessels are hyperemic. In the body, the reaction of blood vessels increased, they were characterized by hyperemia, hemorrhages.

Conclusions

1. Adding different doses of sodium fluoride solution to water showed its negative effects on the organism of laboratory animals. Its acute toxic dose for mice was 50 mg/l, and the total lethal dose was 450 mg/l.
2. The main pathological changes in fluoride poisoning were manifested by spot hemorrhages and hyperemia in the chest and lungs, enlarged liver, spleen, and kidneys, hyperemia in heart vessels, redness and hemorrhages in the mucous membranes of the stomach. There are yellow-brown dot marks in the enamel layer of the teeth, which were manifested by bone loss.

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