

STUDY OF ACUTE TOXICITY OF THE DRUG NaX-L1

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Abstract. The acute toxicity of the drug NaX-L1 was studied in comparison with Polysorb ® , produced by Polysorb JSC. LD50 of the drugs NaX-L1 powder and Polysorb ® , produced by Polysorb JSC, Russia is a dose of > 10000 mg/kg. The investigated adsorbent NaX-L1 – powder, according to the indicator of acute toxicity, was the biological equivalent of Polysorb ® .

Keywords. Sorbent, acute toxicity, detoxification.

Sorbents are widely used in medical practice for detoxification of the body in the prevention and treatment of various diseases. The sanogenic effect of sorbents can be enhanced if biologically active substances (enzymes, cells, etc.) are applied to their surface. At the same time, the sorbent acts both as a carrier for the delivery of active substances, for example, to the necessary parts of the gastrointestinal tract, and as a detoxifier. Natural compounds involved in metabolism and appearing in tissues and biological fluids can also act as endotoxins [1, 2]. Sorbents must be mechanically strong, chemically resistant, have specified standardized granulometric and textural parameters, have a certain chemical composition, minimally injure biological tissues, do not have a toxic effect on organs and tissues, do not absorb protein and oxygen from blood and lymph, do not disrupt the mineral balance in the body, be selective with respect to certain classes of compounds, have an optimal sorption capacity, "work" throughout the gastrointestinal tract, well and completely evacuate from it [3-6].

The purpose of the study: to study the acute toxicity of enterosorbent NaX-L1.

Material and methods of research: acute toxicity was studied by the generally accepted method described in the literature, a single injection of drugs with the determination of the toxicity class in comparison with the reference drug "Polysorb®", produced by JSC "Polysorb", Russia [7].

For the experiment, white mongrel male mice were used in the amount of 36 heads, body weight 19-21 g, kept in quarantine for 14 days. An experiment to study the acute toxicity of the compared drugs was carried out in two series. In the first series of the experiment, white mice were divided into 3 groups of 6 heads each. Mice of each group were once intragastrically injected with a 25% aqueous suspension (500 mg of powder + 2 ml of distilled water) of the drug NaX-L1 – powder as follows:

Group 1 (6 mice) – per os at a dose of 5000 mg/kg (0.4 ml);

Group 2 (6 mice) – per os at a dose of 7500 mg/kg (0.6 ml);

Group 3 (6 mice) – per os at a dose of 10000 mg/kg (0.8 ml).

In the second series of the experiment, similarly white mice were divided into 3 groups of 6 heads each. Mice of each group were once intragastrically injected with a

25% aqueous suspension of the drug "Polysorb®", manufactured by JSC "Polysorb", Russia as follows:

Group 1 (6 mice) – per os at a dose of 5000 mg/ kg (0.4 ml);

Group 2 (6 mice) – per os at a dose of 7500 mg/kg (0.6 ml);

Group 3 (6 mice) – per os at a dose of 10000 mg/kg (0.8 ml).

On the first day of the experiment, the animals were monitored hourly in the laboratory, while the indicators of appearance (condition of the coat, mucous membranes, etc.), functional state (survival during the experiment, general condition, possible seizures and death) and behavior were recorded. Further, every day, for 2 weeks in vivarium conditions, animals of all groups were monitored for the general condition and activity, behavioral characteristics, reaction to tactile, painful, sound and light stimuli, frequency and depth of respiratory movements, heart rate, condition of hair and skin, tail position, quantity and consistency fecal masses, frequency of urination, changes in body weight, etc. indicators. All experimental animals were kept in the same conditions and on a common diet with free access to water and food [7].

After the experiment was completed, LD50 and the toxicity class of the drug were determined [8].

The results obtained: When studying the acute toxicity of the drug NaX-L1 – powder, the following data were obtained:

Group 1 (dose 5000 mg/ kg): after administration of the drug during the day, the mice remained active, no changes in behavior and functional state were observed. The condition of the coat and skin is normal without changes, food and water were not refused, the death of mice was not observed. On the second day and in the subsequent period of observation, there were no pathological changes in the behavior and physiological parameters of mice. The consumption of water and feed is normal, there was no lag in growth and development. There was no death of mice within 14 days.

Group 2 (dose 7,500 mg/ kg): after administration of the drug during the day, the mice were active, there were no visible changes in behavior and functional state. The condition of the coat and skin is normal without changes, food and water were not refused, the death of mice was not observed. On the second day and in the subsequent period of observation, there were no pathological changes in the behavior and physiological parameters of the mice. The use of water and feed is normal, there was no lag in growth and development. There was no death of mice within 14 days (Table No. 1).

Table No. 1

Determination of acute toxicity of drugs NaX-L1 – powder and Polysorb®, manufactured by Polysorb JSC, Russia

Anim al No.	NaX-L1 – powder				Polysorb®, manufactured by Polysorb JSC, Russia			
	mg/k g	volum , ml	metho d of ministrati	result	mg/k g	volum , ml	method of nistration	result

			on					
1	5000	0,4	per os	0/6	5000	0,4	per os	0/6
2	7500	0,6	per os	0/6	7500	0,6	per os	0/6
3	1000 0	0,8	per os	0/6	1000 0	0,8	per os	0/6
L D ₅₀	>10000 mg/kg							

Group 3 (dose 10000 mg / kg) after administration, short-term lethargy and inactivity were observed in mice, which passed after 30-40 minutes. After 1 hour, the mice returned to their previous state, active behavior, physical indicators did not deviate from the norm.

On the second day and during the entire observation period for 14 days, no changes were observed in the behavior and other physical indicators of the mice, the mice willingly consumed food and water, reactions to light and sound stimuli remained normal, the coat and skin were clean, urination and fecal excretion were normal, the weight and growth of the mice did not lag behind in development. The death of mice was not observed

Similar data were obtained in the study of acute toxicity of the drug "Polysorb®", produced by JSC "Polysorb", Russia. Since, according to literature data, the volume of injected fluid with a single intragastric injection is no more than 0.8 ml, the administration of a larger dose of drugs was not possible.

The LD50 of the preparations NaX-L1 – powder and Polysorb®, manufactured by JSC Polysorb, Russia, is a dose of > 10000 mg/kg.

Thus, the investigated sorbent NaX-L1 – powder with a drug analog "Polysorb®", produced by JSC "Polysorb", Russia in terms of acute toxicity were biologically equivalent.

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