Morphological features of animal organs after introduction of new ALX-5 % protein-salt solution

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Objective. To investigate the morphological features of the internal organs of experimental animals and identify potential target organs with the introduction of ultra-high doses of the drug ALX-5 % and the drug with double the concentration of components ALX-2N.

Materials and methods. The experiments were performed on outbred white male mice and outbred white male rats. Animals were administered ALX-5 % and ALX-2N solution. ALX-5 % protein-saline solution contains: donor albumin (5 %) pentatomic alcohol xylitol (5 %), alkalinizing components – sodium lactate (1.9 %) and sodium bicarbonate (0.01 %), as well as sodium chloride (0.8 %), potassium chloride (0.03 %), calcium chloride (0.01 %). Theoretical osmolality – 990 mOsm/l, pH – 6.2-7.4. The drug with double the concentration of ALX-2N contains all these components in double the concentration (osmolality of the solution – 1980 mOsm/l). ALX-5 % was administered intraperitoneally multiple times at a dose of 174 ml/kg for mice and 90 ml/kg for rats. These doses are conditionally toxic, as these doses are the maximum that animals have been able to administer. Further increase in the volume of infusion solution was not allowed due to possible excessive hypervolemic effect. The ALX-2N solution was administered at a dose of 50 ml/kg. At the end of the experiment, histological preparations were prepared from the internal organs of animals, which were stained with hematoxylin and eosin and toluidine blue and studied under a light microscope.

Results. The drug ALX-5 % is a hypertonic solution with a theoretical osmolality of 990 mOsm/l. The drug with double the concentration of ALX-2N contains all these components in double the concentration (osmolality of the solution – 1980 mOsm/l). ALX-5 % was administered intraperitoneally multiple times at a dose of 174 ml/kg for mice and 90 ml/kg for rats. These doses are conditionally toxic, as these doses are the maximum that animals have been able to administer. Further increase in the volume of infusion solution was not allowed due to possible excessive hypervolemic effect. The ALX-2N solution was administered at a dose of 50 ml/kg. At the end of the experiment, histological preparations were prepared from the internal organs of animals, which were stained with hematoxylin and eosin and toluidine blue and studied under a light microscope.
**Results and discussion.** It was found that when white mice and white rats were injected with the native protein-salt preparation ALX-5 % (osmolarity of the solution – 990 mOsm/l) in ultra-high doses (174 ml/kg for mice and 90 ml/kg for rats) the main target organs were the brain and lungs. Changes in other organs (kidneys, liver, pancreas, spleen, heart) are uncritical. With the introduction of concentrated drug ALX-2N (osmolarity of the solution – 1980 mOsm/l) at a dose of 50 ml/kg in addition to pronounced changes in the lungs and brain, dystrophic changes of heart and liver cells are observed.

In all the study groups of animals accumulation of glycogen was observed, which is obviously due to administration of the high dose polyhydric alcohols xylitol and sodium lactate, a significant part of which is metabolized in the liver.

**Conclusions.** According to the results of a comprehensive study of pharmaco-toxicological properties, it was found that the multicomponent protein-salt solution ALX-5 % may be suitable for further clinical study.

**Key words:** morphological studies of organs, hyperosmolar drugs, ALX-5 %.