

# **DECAMETOXIN ACUTE TOXICITY STUDY AND ITS MEDICINAL FORM "DECASAN" FOR THE TREATMENT OF INTESTINAL INFECTIONS**

Derkach N.N., Shtrygol' S.Yu., Laryanovska Yu.B., Shapoval O.N.

The National University of Pharmacy, Kharkiv, Ukraine

«YURiA-PHARM» LTD, Kiev, Ukraine

d@hyalual.com

The search of effective and safe drugs for the treatment of intestinal infections is topical problem. One of the ways of this problem solution is the possibility of decamethoxin using for oral administration. Decamethoxin is cationic active surface detergent with a broad spectrum of antibacterial, antiviral, antifungal activity. It has the ability to degrade the microbial toxins, causes anti-inflammatory and anticholinesterase effects. 0.02% isotonic solution of decamethoxine is called "Decasan" ("YURiA-PHARM", Ukraine), which is widely used for the treatment of septic surgical diseases in neurosurgery, stomatology, otorhinolaryngology, urology, gynecology, pulmonology in the form of washing, irrigation, rinsing, inhalations. It is known that the decamethoxin solution has been effectively used for a long drop irrigation of digestive anastomosis zone for prevention of complications associated with seams failure. There is a question about the possible acute toxic effects on the macro-organism within the complex of preclinical studies of decamethoxin by new indication (intestinal infection).

**The purpose** of the research is to determine the acute toxicity of decamethoxin and "Decasan" when administered orally.

**Materials and methods.** LD<sub>50</sub> of decamethoxin substance (by the Pastushenko method) and the "Decasan" was determined according to the guidelines on pre-clinical study of drugs in rats of both sexes with body weight 180-200 g after single intragastric administration. The "Decasan" was administered in a dose of 20 ml/kg because decamethoxin concentration is low (0.02%) and according to the guidelines for pre-clinical study drugs limiting volume of liquid for intragastric administration in rats with such body weight is 5 ml. The substance of decamethoxin was administered in a maximum tolerated single dose of 400 mg/kg intragastrically. The general

condition and dynamics of body weight was evaluated. Animals were euthanized on the 3<sup>th</sup> and 15<sup>th</sup> day after drug administration. The coefficients of internal organs mass were determined. The condition of the liver, kidneys, heart, lungs, adrenal glands, spleen, thymus, stomach, intestine in all parts, gonads was evaluated macroscopically and by light microscopy with hematoxylin-eosin staining.

**The Results.** It was impossible to determine LD<sub>50</sub> of "Decasan" after single administration intragastrically because the maximum dose for its administration 20 ml/kg has no toxic effect in animals and does not cause their death. The LD<sub>50</sub> of decametoxin substance is 586 (484÷588) mg/kg, which corresponds to the IV<sup>th</sup> class of toxicity – low-toxic substances (500 mg/kg<LD<sub>50</sub><5000 mg/kg). The decametoxin substance toxic dose (400 mg/kg) did not cause the death or disturb the dynamics of body weight during a two-week observation. Mass coefficients of internal organs had no differences with the control. In 2 days there are signs of the mucous membrane irritation in the gastric fundus and pyloric part microscopically. Epithelial cells were flatter with increased exfoliation. Somewhere it was found the initial stages of superficial erosions formation, subepithelial capillary network is full-blooded. The single extended glandular tubes which are same to cyst, submucosal edema, full-blooded vessels and somewhere subepithelial stromal edema were observed in the stomach. The reactive changes in the thymus, some stress of adrenocortical zona fasciculata and the chromaffin cells of the adrenal medulla, slight decrease in the protective effect of small intestinal mucosa were observed. These changes were transient and in 14 days after intragastric administration of decametoxin substance in a dose of 400 mg/kg were absent. There were no pathological changes in other organs.

**Conclusion.** "Decasan" that is 0.02% decametoxin solution, has acceptable parameters of acute toxicity and a high level of safety. The LD<sub>50</sub> value for the "Decasan" in rats can not be established because the administration of the drug in a dose more than 20 ml/kg is not possible. LD<sub>50</sub> of decametoxin substance is 586 mg/kg, which corresponds to the IV<sup>th</sup> class of toxicity – low-toxic substances. Slight irritation of the gastric mucous membrane after decametoxin substance administration is temporal.