

PHARMACOLOGICAL RESEARCH OF GEL WITH GLUCOSAMINE 1% AND ITS COMBINATIONS WITH NANOPARTICLES OF SILVER ON MODEL THERMAL INJURY IN ANIMALS

Ivanova K. S., Bulyga L. A., Butko Y. A.

National University of Pharmacy, Kharkiv, Ukraine

katechk@gmail.com

Introduction. In the period from 2012 to 2015 every year growing number of victims of burn injuries, among them about 60% are subcutaneous skin burns I-II degree. To ensure effective treatment of burns the medicines of local action should identify antioxidant, anti-inflammatory, antimicrobial, reparative activity. But despite the wide range of other medicines on the pharmaceutical market of Ukraine actuality it's the development of more effective treatments that extend the range of local medicines.

Thermal burn is burn, which obtained by contact with a liquid, solid or gaseous heat source. The first place in the statistics occupy flame burns (about 84% of all thermal burns).

Second-degree burns are superficial burns, since their depth is not sprout affects the skin layer, thus in places such skin burns itself is able to recover. At the time of a burn is determined hyperemia and edema of the skin. It is characteristic for second-degree burn blister with clear liquid. This is accompanied by burning pain that can persist for two - three days.

In previous researches have revealed the presence of wound healing activity gel with glucosamine 1% and gel with nanoparticles of silver and glucosamine (NPS + G). Gels were developed under the guidance of prof. Ruban O. A. at the department of Industrial technology NPhU.

Purpose of the study. The stabilization of membrane antioxidants in the 1st phase of wound healing ensures prevention of secondary necrosis, and in the 2nd is stimulate regeneration processes, so the purpose of the study was to investigate the intensity lipid and protein peroxidation in rats with burn wounds in the treatment of study medicines.

Materials and methods. Second-degree burn modeled in rats under tiopental anesthesia on the dehaired skin of back. To simulate second-degree burn using a special device with a metal plate with a diameter of 2.5 cm. Contact with skin plate heated to 200⁰ C was 4 seconds. The experiment used 90 white rats divided into 5 groups of 18 animals each. Each day gel applied to the affected skin at a dose of 50 mg per cm². Blood sampling for analysis performed in two periods: the early discharge of crusts (7th days) and 21th days. Were decapitated 6 rats from each group. Biochemical studies of blood serum conducted on the basis KhNMU in

cooperation with assoc. Gorbach T.V. on indicators: the level of oxidative modification of proteins (OMP), lipid peroxidation (LPO), free SH-group.

In the experiment stick "General ethical animal experimentation" (Ukraine, 2001) harmonized with the "European Convention for the Protection of vertebrate animals used for experimental and other scientific purposes" (Strasbourg, 1985). Results processed using Statistica 7.

Results. In the treatment of animals studied gels observed activation of healing burn wounds. Complete epithelization was held for 15th day (gel with glucosamine and glucosamine with nanoparticles of silver) in the group treated with cream "Dermazin" - for 17th day, the control group pathology - in 21th day.

When treating animals with burns observed reduction OMP. This indicates termination of destructive processes in the wound and does not prevent the process of tissue regeneration. Compared with the group of CP in animals treated with glucosamine gel level APH for 21th days was below 1.8 times and in animals treated with the gel NPS + G and cream "Dermazyn" 1.2 times ($p < 0, 05$). Level KPH – 7th day in 2.5 times, 1.6 times and 1.5 ($p < 0.05$) at 21th days - 2.5, 1.7 and 1.6 times ($p < 0.05$) respectively.

Availability membrane stabilizing effect in the studied gels suggest a probable reduction of TBA-P and DC in animal blood during treatment. After 21th day in the group that was treated with the gel HPS + G data rates significantly normalized, the group, which was applied mono gel, cream "Dermazyn" and KP exceeded the norm by 1.4 times, 1.7 times, 2.2 times and 1.2 times, 1.4 times, 1.3 times ($p < 0.05$), respectively.

During prolonged inflammatory process may increasing the level of SH-groups. On 21th day in group, which was treated gel with glucosamine content of SH-groups reached the level of intact values, while in groups of the gel with NPS+G, cream "Dermazin" and the group CP in 1.3 times, 1.4 times, 1.1 times and 1.6 times respectively were significantly higher than normal. However, compared with group CP content of SH-groups in rat blood, causing gel with glucosamine, gel with NPS+G and the reference drug was below 1.5 times, 1.3 and 1.4 times ($p < 0.05$) on 7th day, and 1.6 times, 1.2 and 1.4 ($p < 0.05$) time for 21th days.

Conclusion. Thus, biochemical blood serum tests of animals with burn wounds in the treatment of experimental gels demonstrate the presence membrane stabilizing and antioxidant effect of nanoparticles of silver and glucosamine. So perspective is further pharmacological researches the properties of nanoparticles of silver and glucosamine to create local healing medicines a new generation and efficiency improvements treatment wound healing.