Abstract Submission

Ophthalmic Trauma

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Experimental Study on Pharmacological Efficacy of Liposomal Quercetin in a Corneal Acid-Burn Injury Model

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Objective: To investigate the efficacy of liposomal quercetin (LQ) in different administration modes (topical eye drops, subtenon injection) in a second-degree acid-burn injury of cornea in rabbits.

Methods: In rabbits, an acid-burn injury of the cornea was induced by applying a 6-mm round filter paper disc to the cornea. The disc was previously soaked in 3% acetic acid solution with 5-second exposure under local anesthesia (0.4% inocaine). 21 rabbits were assigned to 3 groups, 7 in each group (Group I, II and III). Right eye of every rabbit was treated, the fellow eye was intact. Group I received two drops of saline solution and served as control. Group II received a subtenon injection of LQ, 1 mL every five days (3 injections). Group III received LQ topically; 2 eye drops three times a day until the complete disappearance of the inflammation signs. Treatment started on the next day after inducing an acid-burn injury. All eyes were examined with slit-lamp biomicroscopy. The intensity of the inflammation was assessed using the Draize test according to the condition of the cornea and conjunctiva. Pharmacological activity of the drug was calculated by the degree of inflammation intensity and the reduction of corneal opacity compared with baseline. After 14 Day, the animals were killed and the eyes were enucleated and examined with electron microscopy.

Results: Ophthalmic biomicroscopy showed that topical eye drops and subtenon injection of LQ (a) had pronounced anti-inflammatory and anti-edematous effects, (b) stimulated regenerative processes, (c) accelerated the restoration of corneal transparency. At Day 14, 7 eyes in Group II had cloud-like opacity sized ¼ burn injury; 5 and 2 eyes in Group III had cloud-like opacity sized ¼ and ½ burn injury, respectively; 7 eyes in Group I had cloud-like opacity sized ≥ ½ burn injury). The Draize test showed no inflammation signs in the anterior eye at Day 7, Day 10, and Day 14 in Groups II, III, and I, respectively, which indicated the pronounced effect of LQ. Electron microscopy showed that (a) topical LQ significantly decreased swelling in corneal structures, i.a. hyaloplasm and organelles; (b) LQ subtenon injections activated metabolic processes, which resulted in an increased number of organelles aimed at protein synthesis and energy production.

Conclusion: Study on the pharmacological action of LQ is a justification for its clinical trial for treatment of corneal burn injuries topically and/or subtenon injections.

Disclosure of Interest: None Declared