The Effects of Intravitreal Administration of Antifungal Drugs on the Structure and Mechanical Properties Peripheral Blood Erythrocyte Surface in Rabbits

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Int J Mol Sci. 2022 Sep 9;23(18):10464. doi: 10.3390/ijms231810464

https://pubmed.ncbi.nlm.nih.gov/36142376/

Background: Fungal infections can pose great threat to sight. Immediate treatment is usually required; antifungal agents are widely accepted and are effective in most cases. The present experimental study aims to investigate the probable effects of intravitreal injection of antifungal agents on the structure and mechanical properties of the surface of peripheral blood erythrocytes.

Methods: Nine albino New Zealand white rabbits, aged five months old, were chosen for the experiment. Solutions of micafungin, voriconazole, or balanced salt solution (BSS) were injected into the midvitreous. Animals were divided into two experimental groups and one control group. Blood sampling from an intravenous (IV) line was performed after 10 days from the last IV injection. An atomic force microscope (AFM) was used to study the structural and mechanical properties of cell surfaces.

Results: The analysis results showed that the parameters of the cytoskeleton's spatial organization changed insignificantly with the antifungal drug treatment.

Conclusions: Our findings suggest that locally administered antifungal drugs can cause significant changes to the structure and frictional properties of the erythrocyte surface. These effects occur in the long-term period after administration of the drugs and represent a potential possibility for violation of blood supply to tissues, and the further development of negative side effects.