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Disorders of microcirculation in the mechanism of bisphosphonate osteonecrosis: preliminary study in rats

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Abstract:	Purpose. Determine the possibilities of angioprotection and reduce osteonecrosis while using bisphosphonates. Material and methods. In our experiment, 27 rats were used that were divided into 3 groups: group 1 was injected with saline, group 2 was administered zoledronic acid for 6 weeks, group 3 was administered zoledronic acid for 6 weeks and the subsequent administration of sulodexide. After that there was modeling of extraction of the teeth. A linear blood flow velocity was studied using laser and high-frequency Doppler ultrasound in the periodontal area of an extracted tooth in rats with the application of vasoactive substance Acetylcholine 3% for 1 min. Evaluation of changes in the structure of bone tissue was carried out by computed tomography of the head of the rats studied, comparison of data with the control group and the saline group. Results. A rapid decrease in microcirculation was detected during the use of Zoledronic acid for 6 weeks. Lower decrease in microcirculation was detected after 3 week Sulodexide therapy during the use of Zoledronic acid for 6 weeks. A decrease in blood flow in the mucous membrane and, to a greater extent, in bone tissue was detected. Conclusion. Zoledronic acid causes a statistically significant impairment of the periosteal blood flow, mucous membrane due to a complex of disorders, which includes both the cellular component (impaired endothelium-dependent vasodilation of the mucous membrane vessels) and in reducing the microcirculation intensity in the mucous membrane and bone tissue. However, the use of sulodexide improves blood flow restoration and reduces the size of osteonecrosis that occurs. Bisphosphonate osteonecrosis, zoledronate, sulodexide, dopplerography Sulodexide as an osteonecrosis prevention drug. Keywords: Bisphosphonate osteonecrosis, zoledronate, sulodexide, dopplerography, Sulodexide as an osteonecrosis prevention drug.

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We confirm that, to our knowledge, all the claims, statements and conclusions are true and are our jointly held opinions.

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