

THE EVALUATION OF CHANGES IN BONE TISSUE AND TENDONS OF ANIMALS SUBJECTED TO CORTICOSTEROID THERAPY

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The purpose of this study was to examine the effect of systemic glucocorticosteroid administration on bone tissue and tendons of animals. The study was conducted on 20 adult Wistar rats. Animals from experimental group were subjected intraperitoneally to hydrocortisone (10 mg/day) for 10 weeks. 24 h after the last injection the animals were decapitated and bone femur and Achilles tendon were collected.

Estimation of changes in the bone tissue was consisted in examination of bone density, biomechanical parameters and analysis of the bone composition.

Measurements of density of femoral bone showed statistically lower values in the experimental group. Changes observed in the bone density had an analogue in biomechanical parameters determined at the point of maximum load and at the elasticity limit. Biomechanical parameters determined on the edge of maximal load and elasticity limit showed that the femoral shafts of animals subjected to hydrocortisone were deformed similarly to those from the control group. However, such deformations were caused by a significantly lower load. Measured biomechanical parameters correlated with the changes in the composition of the bones.

The evaluation of changes occurring in the tendons was conducted based on the resistance tests. Hydrocortisone administration caused reduction of force value and increase of strain, the values of elasticity module were also significantly smaller compared to the control group. The results of biomechanical tests suggested that glucocorticoids produce less stiffness tendon, which fails in the maximum point of the load. This study revealed that systemic hydrocortisone administration changes significantly mechanical properties of tendons, what may frequently cause failure of the tendon.