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FACULTY OF VETERINARY MEDICINE - SKOPJE

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P9 GENISTEIN STIMULATES TRABECULAR BONE STRUCTURE IN ORCHIDECTOMIED MIDDLE AGED MALE RATS

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Introduction: The soybean isoflavines with estrogenic activity used as natural substitute for hormone replacement therapy for prevention and treatment of postmenopausal osteoporosis. In recent years, more attention has focused on role of estrogens on bone metabolism in men. Therefore, the aim of this study was to investigate the effect of isoflavone genistein on the trabecular bone in orchidectomized (Orx) miidle-aged rats as animal model of male osteoporosis.

Material and Methods: Sixteen-month-old Wistar rats were divided into Orx and a sham-operated (SO) group. Two weeks after gonadectomy, subcutaneous injections of genistein (30 mg/kg b.w./day) were administered for 3 weeks. The SO and one Orx group were received sterile olive oil. The animals were killed 24 h after last injection. After fixation and decalcification the proximal tibias were stained by an Azan method. An ImageJ public domain image processing program was used for histomorphometric measurements in the proximal tibial metaphysis and calculate cancellous bone area (B.Ar), trabecular thickness (Tb. Th), trabecular number (Tb.N) and trabecular separation (Tb.Sp). Serum samples were analyzed for osteocalcin (OC) levels, and urine samples for calcium (Ca^{2+}) levels. The data were assessed for normal distribution by the Kolmogorov-Smirnov test, followed by one-way analysis of variance (ANOVA).

Results: Analysis of trabecular microarchitecture of proximal tibia in the Orx rats showed a significant decreases of B.Ar, Tb.Th and Tb.N whereas Tb.Sp was significantly increased compared to SO. After Orx, serum OC and urinary Ca^{2+} concentration significantly increased in comparison with SO. Genistein treatment in Orx rats significantly enhanced B.Ar, Tb.Th and Tb.N by 115%, 26% and 34% ($p<0.05$) respectively; but Tb.Sp was 38% lower ($p<0.05$) when compared to the Orx. Serum OC was 31% lower ($p<0.05$) after genistein

administration compared to values for the Orx rats. Urinary Ca^{2+} concentration was lower than in the Orx by 68% ($p<0.05$).

Conclusion: These results suggest that chronic genistein treatment increase trabecular bone mass and decrease bone turnover in the rat model of male osteoporosis.

Key words: genistein, male rats, orchidectomy, trabecular bone, bone histomorphometry