EFFECT OF BORON SUPPLEMENTATION IN THE PARAMETERS OF STRENGTH AND BONE MICROSTRUCTURE IN NON-OBESE DIABETIC MICE

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Diabetes Mellitus is a chronic disease characterized by a disorder in the metabolism of carbohydrates, lipids and protein. Studies have shown that this disease negatively affects the activity of osteoblasts that play a role in osteoporosis, thus the objective this study was investigate the influence of a boron supplementation on bone metabolism of control and non-obese diabetic mice (NOD) for 30 days. The animals were supplemented with 40 µg/0,5 ml of boron solution (boron chelate H 5%). We evaluated the possible bone changes during the development of complications caused by diabetes through of the femoral bone site analysis by computed microtomography and analyzed the biomechanical assay at three point test in tibia and femur. This study consisted of 28 animals divided in four groups: Group CA: non diabetic animals (n=10) that received 0,5 ml/day of distilled water, Group CB: non diabetic animals (n=8) that received 0,5 ml/day of boron solution, Group DA: diabetic animals (n=5) that received 0,5 ml/day of distilled water and Group DB: diabetic animals (n=5) that received 0,5 ml/day of boron solution. The results showed that bone volume for the DB group was significant higher compared with CA and DA (p<0.05). In relation to trabecular bone, volume fraction was higher for the CB group when compared with CA and DA. The values for specific bone surface were higher for the DB group compared with CA. The trabecular thickness and structure model index were significantly different for the CB, CA when compared with DA group. Biomechanical test revealed maintenance of parameters the bone strength in animals DB compared with the DA group and controls. However, the results showed improvement in both strength and bone mass in animals supplemented with boron.

Key words: Diabetes, Boron, Bone Metabolism.