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HIGH-SPEED MECHANICAL TORSION TEST IN FEMURS OF RATS SUBMITTED TO VIBRATORY PLATFORM TRAINING

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Summary: Introduction: Considered a disease of the 21st century, sedentary life is considered as a lack or reduced practice of physical activity and is harmful to health and can lead to cardiovascular and musculoskeletal problems. The vibratory platform responds to the comfort and ease of physical activity bringing some benefits such as avoiding negative effects of functional incapacity, muscle atrophy, fractures and fragility of the skeletal system.
Objectives:To evaluate bone mineral density and mechanical properties, the high-speed torsion of femurs of free healthy rats and induced to physical training on vibration platform at 60 Hz, during the post-neonatal period until reaching the adult stage at 12 weeks.
Methods: Twenty Wistar rats with body mass ranging from 55 to 70 g at 21 days of age were divided into two groups (n = 10): Group A (free, control); Group B (free, trained at 60 Hz, for 20 minutes, 5 times per week). The training protocol was the same as Oxlund et al. (2003). The adaptations with three individual bays. Both groups remained under treatment for 12 weeks until euthanasia. The effects of vibration on the animals were evaluated through total body densitometry (DMO) by an X-ray densitometry device (Hologic, Discovery Wi®, USA), Laboratory of Endocrinology and Imaging Sciences and Medical Physics of Clinical Hospital of the Medical School of Ribeirão Preto. High-speed mechanical torsion tests were carried out on females in prototype of the test machine developed by the research group. For the tests the femur ends were included with methylmethacrylate cement, for ease of fixation and definition.
Results: BMD of the femurs of the two groups analyzed did not present a statistically significant difference (p = 0,314). The comparison between the properties of energy absorbed before fracture, maximum torque and fracture angle. In the two groups analyzed, there was a statistically significant difference in all the comparisons.
Conclusion: Although there was no significant difference in BMD, the results of the mechanical parameters showed that the platform training worsened the mechanical properties of the torsion at high speed when compared to the control group.