

EFFECTS OF SWIMMING ON THE STRENGTH OF THE ANTERIOR CRUCIATE LIGAMENT OF SEDENTARY RATS

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Summary: Introduction and objective: Anterior cruciate ligament (ACL) is an important structure to stability of knee and has higher risk of lesions during sport practice. The instability of knee can progress to functional and other structural lesions. Exercise is considered important to good health but not prepared people that initiate exercise may undergo lesions. So, it is important to investigate if sedentary life style can also be a factor risk to anterior cruciate ligament lesions.

Knowledge about mechanical characteristics of biological tissues are important to biomechanics, medicine and sports. The purpose of the present study was to evaluate the effects of exercise in the mechanical strength of ACL in rats submitted to sedentary life style.

Methods: It was an experimental study previously approved by the Ethics Committee on Animal Experiments of the Ribeirão Preto Medical School at University of São Paulo, n^o X/2012. Sixteen male Wistar rats were divided into two groups (n=8): TR (trained) and NT (not trained). The animals were induced to sedentary life style using cages with reduced internal space (19x19x12 cm). The animals of TR group were submitted to a swimming protocol adapted to rats. The training consisted in 60 minutes daily during 8 weeks. Animals body mass were evaluated weekly during the experiment. After experimental period the animals were submitted to euthanasia with an overdose of anesthetic, ACL was removed and analyzed by mechanical test. Data were compared using test T Student, and adopting significance level of 5%.

Results: Animals of TR group showed body weight mean of 504.28 (SD 53.73) and NT group 452.86 (SD 23.78) with difference between groups (p=0.039). Mean of maximal force was decreased in TR group (5.68 SD 0.62) when compared to NT group (6.98 SD 0.90) (p=0.008) but there was no difference in displacement between groups (0.271).

Conclusion: High body weight observed in TR group can be suggestive of muscle mass gain with swimming training. Sedentary life style may have caused fragility of ACL. So, animals submitted to swimming training may have undergone more intense microlesions of ACL which was more susceptible to rupture in the mechanical test.