Effect of physical activity on sedentary urinary glycosaminoglycans excretion

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It is unknown the ideal exercise conditions to a healthy cartilage. Analyze degraded matrix metabolites, like glycosaminoglycans (GAGs), which are released on synovial fluid and may be recycled or excreted on urine, would be a good way to understand cartilage turnover. The aim of this study was to analyze urinary GAGs excretion pattern of sedentary individuals in normal conditions and in moderate exercise according to American College of Sports Medicine. Selected individuals were classified in two groups (sedentary or irregularly active-IA) according to International Physical Activity Questionnaire. Urinary GAGs were extracted and purified by ion exchange chromatography from urine samples (n=15) 2 times/day (morning and night) for three consecutive days. Then, each individual underwent a physical activity for 30 minutes controlled by frequency counter, and samples were collected before, immediately after and 24 hours after exercise. GAGs were analyzed by agarose gel electrophoresis on PDA buffer. Excretion was analyzed as creatinine ratio to correct urine dilution. Individuals mean age was 22.8±2.01 years old and mean body mass index was 22.0±1.88 kg/m². Chondroitin sulfate (CS) was the major GAG found in urine, but small amounts of dermatan sulfate and heparan sulfate could also be found. Both Sedentary and IA groups showed higher CS excretion in morning than night, following a constant pattern. Even sedentary and IA presented lower CS excretion after exercise, with higher decrease on the first group. After 24 hours samples returned to the initial CS pattern. Results indicate that in moderate exercise cartilage may keep its homeostasis.

Keywords: Extracellular matrix, Glycosaminoglycans, Sedentarism, Exercise.