

**Does Experimental Anterior Knee Pain Alter Effects of Running on Femoral Articular Cartilage Thickness and Volume? A Pilot Study**

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**ABSTRACT**

Anterior knee pain is a common problem for runners that often alters running biomechanics. It is unclear how/if changes in running biomechanics due to anterior knee pain affect knee articular cartilage health. **PURPOSE:** To determine if experimental anterior knee pain during running acutely alters deformation in femoral articular cartilage due to running. **METHODS:** 10 runners completed three sessions that each involved a 60-min treadmill run: a control, sham, and pain session. Experimental anterior knee pain was induced during the pain session via a continuous infusion of hypertonic saline into the infrapatellar fat pad. The sham and control sessions involved a continuous infusion of physiological saline and no infusion, respectively. Before and after running, magnetic resonance imaging was used to quantify femoral articular cartilage thickness and volume. A repeated measures ANOVA was used to evaluate effects of running with experimental anterior knee pain on perceived knee pain and femoral articular cartilage deformation ( $\alpha = 0.05$ ). **RESULTS:** Perceived anterior knee pain was significantly greater during the pain session relative to the control and sham sessions ( $p < 0.01$ ). Mean medial femoral articular cartilage volume decreased more due to the sham session run ( $-41.1 \pm 133.4 \text{ mm}^3$ ) relative to the control session run ( $79.4 \pm 195.2 \text{ mm}^3$ ;  $p = 0.05$ ), and more due to the pain session run ( $-57.7 \pm 157.4 \text{ mm}^3$ ) than the control session run ( $p = 0.09$ ). No significant effects of session were observed for medial or lateral thickness or lateral volume. **CONCLUSION:** Articular cartilage response to running (medial femoral volume) was different for the pain and sham sessions relative to the control session. The physiological and hypertonic saline infusions appeared to alter medial knee articular cartilage response to running. These changes might be due to altered biomechanics due to the infusions. Additional research is needed to clarify the cause of the altered response to running.