INCREASES IN BICEPS BRACHII FASCIA THICKNESS AFTER ECCENTRIC EXERCISE OF THE ELBOW FLEXORS

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BACKGROUND
Unaccustomed eccentric exercise induces muscle damage characterised by delayed onset of muscle soreness (DOMS) and prolonged loss of muscle function, but confers protective effect against the same exercise performed within several weeks, known as the repeated bout effect. The mechanisms underpinning the repeated bout effect are not fully understood, but changes in muscle-tendon behaviour seem to be one of them. It is possible that anatomical changes in muscle fascia are associated with the repeated bout effect. The present study investigated changes in biceps brachii muscle fascia thickness after eccentric exercise of the elbow flexors.

METHODS
Ten men (22-28 y) performed two bouts of eccentric exercise of the elbow flexors consisting of 10 sets of 6 maximal eccentric contractions in which the elbow joint was extended from 60° to 0°, using the same arm separated by 4 weeks. Maximal voluntary isometric contraction (MVC) torque and muscle soreness were measured before, immediately after and 1-5 days after each exercise. Biceps brachii muscle fascia thickness was measured by B-mode ultrasonography at the same time points.

RESULTS
Changes in MVC torque and muscle soreness were smaller (P<0.05) after the second than the first bout, showing the typical repeated bout effect. Significant (P<0.05) increases in biceps brachii fascia thickness were evident after the first exercise bout such that the thickness gradually increased from baseline (0.69 ± 0.27 mm) to 1 (0.93 ± 0.32 mm), 2 (1.12 ± 0.29 mm), 3 (1.31 ± 0.28 mm), 4 (1.35 ± 0.31 mm) and 5 days post-exercise (1.53 ± 0.24 mm). Immediately before the second exercise bout, the thickness (1.38 ± 0.3 mm) was not different (P=0.17) from that of 5 days after the first bout. After the second exercise bout, the thickness did not change significantly over time (1.43 ± 0.23 mm at 5 days post-exercise).

CONCLUSION
These results showed that biceps brachii muscle fascia become thicker after the first eccentric exercise bout and remained for 4 weeks. The mechanisms underpinning the increases in the fascia thickness are not clear yet. However, it seems possible that the increased fascia thickness is associated with the repeated bout effect.