

REDUCED MUSCLE STRENGTH FOLLOWING EXPERIMENTAL KNEE PAIN

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INTRODUCTION

Knee pain is very common and is the chief symptom in many disorders, such as osteoarthritis (OA). Muscular dysfunctions, measured as reduced maximal voluntary contractions (MVC), have been associated with knee pathologies [1], and have been suggested to have a contributory role in the development and/or progression of knee disorders. However, since pain is the chief complaint in many knee disorders, and pain can alter motor performance [2], the suggested causal relationship between muscle dysfunction and disease development/progression may be confounded by pain. The effects of knee pain on muscle function remains to be clarified. The purpose of this study was to determine the effects of knee pain on muscle strength. We hypothesised that knee pain would reduce the muscle strength.

METHODS

The study was carried out with a randomized cross over design. Seventeen healthy volunteers (age 21-46 years), were recruited. The study encompassed two visits separated by one week. The subjects had their muscle strength measured in an isokinetic dynamometer (Biodex) at 0°/sec (isometric), 60°/sec, 120°/sec, 180°/sec in both knee flexion and extension.

Knee pain was induced by ultrasound guided bolus injections (.75 ml) hypertonic saline. Isotonic saline injections were used as a non-painful control situation. The order of saline injections was randomized. The MVC measurements were performed before, immediately after and 15 minutes after the saline injections. Pain intensities were registered by means of a 0-100 mm visual analogue scale (VAS).

RESULTS

Hypertonic saline injections effectively induced knee pain. No pain was induced by isotonic saline. The average pain intensity following hypertonic saline was 32 mm (95% CI: 29.2 to 34.9, $P < .0001$).

The pain reduced the MVC at all angular velocities in both knee extension and flexion (figure 1).

DISCUSSION AND CONCLUSION

Knee pain significantly reduced both isometric and isokinetic knee muscle strength in both flexion and extension. The results corroborate the clinical findings of reduced muscle function in painful knee disorders [1], and question the causal role of muscle dysfunction in disease development/progression.

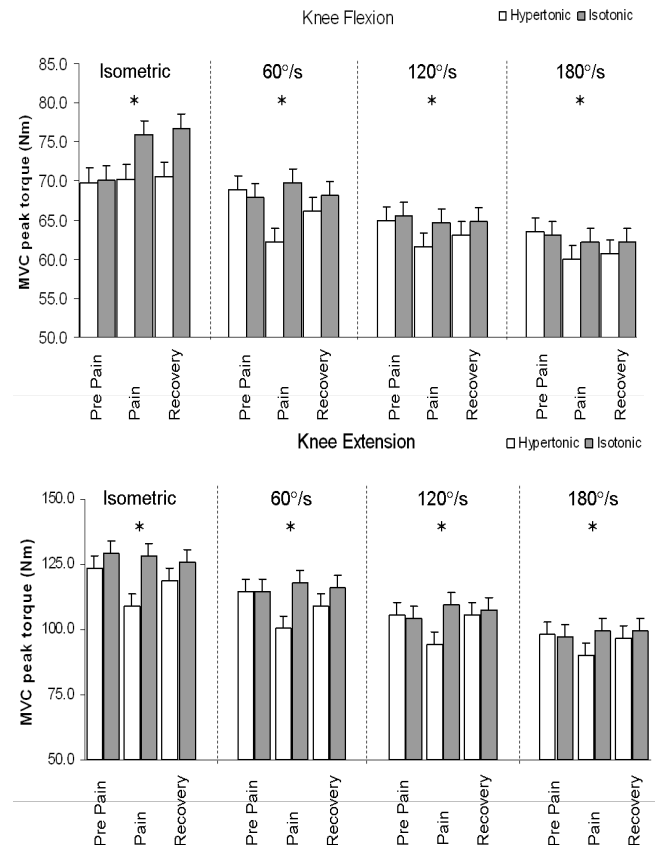


Figure 1

Group mean peak torques measured isometrically and isokinetically before, during and after injections of painful hypertonic saline into the infrapatellare fat-pad (white columns) or non-painful isotonic saline injections (grey columns). Asterisks indicate significant differences ($P > 0.0001$).

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REFERENCES

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