

THE ACUTE EFFECTS OF CONCENTRIC VERSUS ECCENTRIC MUSCLE FATIGUE ON SHOULDER ACTIVE REPOSITIONING SENSE

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ABSTRACT

Purpose/Background: Shoulder proprioception is essential in the activities of daily living as well as in sports. Acute muscle fatigue is believed to cause a deterioration of proprioception, increasing the risk of injury. The purpose of this study was to evaluate if fatigue of the shoulder external rotators during eccentric versus concentric activity affects shoulder joint proprioception as determined by active reproduction of position.

Study design: Quasi-experimental trial.

Methods: Twenty-two healthy subjects with no recent history of shoulder pathology were randomly allocated to either a concentric or an eccentric exercise group for fatiguing the shoulder external rotators. Proprioception was assessed before and after the fatiguing protocol using an isokinetic dynamometer, by measuring active reproduction of position at 30° of shoulder external rotation, reported as absolute angular error. The fatiguing protocol consisted of sets of fifteen consecutive external rotator muscle contractions in either the concentric or eccentric action. The subjects were exercised until there was a 30% decline from the peak torque of the subjects' maximal voluntary contraction over three consecutive muscle contractions.

Results: A one-way analysis of variance test revealed no statistical difference in absolute angular error ($p > 0.05$) between concentric and eccentric groups. Moreover, no statistical difference ($p > 0.05$) was found in absolute angular error between pre- and post-fatigue in either group.

Conclusions: Eccentric exercise does not seem to acutely affect shoulder proprioception to a larger extent than concentric exercise.

Level of evidence: 2b

Key words: Exercise, joint position sense, neuromuscular control

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