

ALTERATION OF QUADRICEPS AND HAMSTRING COACTIVATION PATTERNS POST ACL RECONSTRUCTION

**Mohammad Alkhazim,
King Faisal Specialist Hospital & Research Center, Riyadh, Saudi Arabia**

KEY WORDS: rehabilitation, acl, electromyography, coactivation

INTRODUCTION: It has been postulated that the coactivation pattern of agonist-antagonist knee muscles will be altered post anterior cruciate ligament (ACL) injury. This study's main purpose was to address the question of whether the coactivation patterns of agonist-antagonist knee muscles of subjects with ACL tear return to normal after surgical reconstruction and appropriate rehabilitation.

METHODS: Ten subjects with a similar procedure of ACL reconstruction and rehabilitation programs participated in the study. Electromyography (EMG) data were collected from vastus lateralis, vastus medialis, biceps femoris, and semimembranosus/semitendinosus muscles for normal knees and knees with reconstructed ACL during squatting activity. The squatting action was divided into descending, holding, and ascending phases. Nonparametric statistical analysis was used to analyze the peak normalized EMG values.

RESULTS: The results showed that quadriceps-hamstring coordination is present at all times during squatting activities. Different activation in the vastus lateralis and biceps femoris were found during all phases of squatting between normal knees and those with ACL reconstruction. Activation patterns differed in the vastus medialis and semimembranosus/semitendinosus only during the ascending phase of the squat.

CONCLUSIONS: The study concludes that differences in vastus lateralis and biceps femoris activities might develop to avoid pivoting phenomenon, due to patellofemoral pain syndrome or due to inappropriate ways of exercising the knee muscles post ACL injury or reconstruction.