

Request #: 539 - KHS - Publication/Article

Post-ACL reconstruction Motor Control

Anne Beethe [A02321025] - KHS Faculty

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Background

External cognitive load induces a tonic inhibitory state, diminishing reaction task performance. Post- anterior cruciate ligament (ACL) tear, altered sensorimotor control is theorized to induce internal cognitive burden creating a similar inhibitory state, increasing risk of re-injury due to delay in performance reaction. Yet, the observation of changes in reaction, specifically when posed in an inhibitory action, is unknown. The purpose of this study is to investigate post-ACL reactions in response to produce rapid and goal-specific movements.

Sample

We will collect reaction times, using force plate data, for each 'GROUP' (ACL reconstruction (ACLR) and healthy controls (CON)). Comparisons will be made between 'LIMB' (ACLR injured with CON non-dominant AND ACLR uninjured with CON dominant). All participants will take part in a response task, altered by 'CUE' (proactive cue - participants given time to see the environment before acting, vs. reactive cue - participants only given 400ms to see environment before acting) and by 'STEP' (common - participants will be told a specific step of right or left will occur more often than the other step. This common step will occur 75% of the time vs. uncommon - occurs 25% of the time).

Hypothesis

Our research question is 'does reaction time alter between ACLR and CON, as well as between ACLR healthy and injured limbs. We specifically want to look at the differences in 'CUE' and 'STEP'

We hypothesize that 1) proactive CUE conditions will be statistically the same within group and limb (i.e. CON dominant, CON non-dominant, ACLR injured, ACLR uninjured) 2) ACLR proactive CUE conditions will present with delayed reaction times as compared with CON 3) ACLR injured proactive CUE conditions will be delayed as compared to ACLR uninjured proactive times. 4) All reactive CUE conditions will be delayed in the ACLR (injured and injured limb) uncommon STEP, as compared to the common STEP. 5) All ACLR reactive CUE conditions will be delayed as compared to CON reactive conditions.

Progress

We are at the beginning phases of the study - we are working on pilot data.

Request

I came across a potential statistical analysis problem - after grant submission - and I would like some time to talk about it before proceeding. Additionally, this specific analysis is for a masters thesis project, and I would like to advice this student correctly.

Timeline

No timetable at this time.