MPSS_P2.2  STRENGTH TRAINING REDUCES INTRACORTICAL INHIBITION

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INTRODUCTION: Although considerable evidence exists for neural adaptations to short-term strength training, no study has investigated the intracortical influence on strength development.

AIM: Paired-pulse transcranial magnetic stimulation was used to investigate 4 weeks of leg strength training on corticospinal excitability and short-latency intracortical inhibition.

METHODS: Participants (n = 12) were randomly allocated to either a strength training or control group. The strength training group completed 3 supervised training sessions per week (4 sets of 6-8 repetitions at 80% of single repetition maximum) for 4 weeks. Recruitment curves were constructed from stimuli delivered at 10% of maximum stimulator output below the participant’s active motor threshold, increasing in 5% increments until motor evoked potential amplitude was saturated. Short-latency intracortical inhibition was assessed using a paired-pulse transcranial magnetic stimulation protocol consisting of a sub-threshold (0.7×active motor threshold) conditioning stimulus, followed 3 ms later by a supra-threshold (1.2×active motor threshold) test stimulus. All motor evoked responses were normalized to the maximal M-wave (MMAX).

RESULTS: There were significant (p < 0.01) increases in squat strength and corticospinal excitability, and significant (p < 0.01) reductions in intracortical inhibition for the strength training group following the 4 week intervention. There were no changes in any dependent variable (p > 0.05) detected in the control group.

CONCLUSION: These findings provide evidence that the increases in corticospinal excitability following short-term strength training are attributed to plasticity at a cortical level via reductions in intracortical inhibition.