106 EFFECT OF A SINGLE SHORT ELECTROSTIMULATION SESSION OF THE FIBULARIS MUSCLES ON DYNAMIC POSTURAL STABILITY AND EVERTOR MUSCLES STRENGTH

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Background The fibularis muscles are key elements of the ankle evertor group (evertors). The weakness of evertors is one of the main cause of ankle sprains. Electrostimulation training can increase the maximum voluntary force of contraction by neural adaptation to a healthy skeletal muscle.
Objective To assess whether a single electrostimulation session of the fibularis muscles could impact dynamic postural stability and evertor strength.
Design Single-blind randomised controlled trial.
Setting Motion analysis laboratory in a hospital facility.
Patients (or Participants) Sixteen healthy male and female volunteers, randomly assigned to an experimental (EXP, n=8) or control (Control, n=8) group.
Interventions (or Assessment of Risk Factors) Participants in EXP received a single electrostimulation strengthening session for 3 minutes on the dominant side (DOM) fibularis muscles. Control participants received a sham electrostimulation on DOM with similar modalities.
Main Outcome Measurements Dynamic postural balance was assessed on DOM and non-dominant (NDOM) limbs using the modified Star Excursion Balance Test (SEBT). A composite score (CS in%) was calculated. Evertor strength (in N) was assessed with three maximal isometric voluntary contractions on an isokinetic dynamometer.
Results EXP displayed a significant increase in SEBT-CS on DOM (97.7±5.9% vs 96.1±7.4%, p<0.05) and NDOM (97.6 ±7.2% vs 95.6±7.4%, p<0.01), while these parameters did not change in Control. EXP also displayed a significant increase in Evertors isometric strength on DOM (25.0±7.0N vs 23.1±6.8N, p<0.05) and NDOM (26.8±6.0N vs 22.9 ±5.2N, p<0.001). In Control, evertor isometric strength increased on DOM (24.9±7.4N vs 23.1±6.8N, p<0.01), but remained unchanged on NDOM.
Conclusions A short single fibularis elecrostimulation session on one leg appeared to improve dynamic postural stability on both sides and evertors strength on the stimulated side only, suggesting a global post-activation potentiation effect of this intervention and a possible additional mirror effect on dynamic postural stability. These findings may be of interest for preventing ankle sprain.

107 DOES ANKLE INSTABILITY ALTER MUSCLE ACTIVATION OF LOWER EXTREMITY AND GROUND REACTION FORCE DURING LANDING? A META-ANALYSIS

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Background Altered muscle activation pattern and ground reaction force (GRF) in those with ankle instability (AI) should be clearly investigated in order to incorporate this information to retrain AI patient.
Objective To investigate muscle activation characteristics of AI patient and GRF pattern.
Data Sources Relevant studies were searched from PubMed, CINAHL, SPORTDiscus, and Web of Science through May 2019. Combination of keywords ankle instability, chronic ankle instability, ankle sprain, biomechanics, kinetics, electromyography, and landing were used to search relevant studies.
Study Selection Inclusion criteria for study selection were: 1) subjects with chronic ankle instability, functional instability, mechanical instability or recurrent ankle sprains; 2) the primary outcomes consisted of muscle activation of the lower extremity and GRF during landing; 3) peer-reviewed articles with full-text; and 4) providing appropriate information, which is mean, standard deviation, and sample size to re-analyze data.
Data Extraction Extracted data included muscle activation of the lower extremity (root mean square; integral EMG; mean), the magnitude, and time to peak GRF and was used to calculate standardized mean differences (SMD) with 95% confidence intervals (CIs).
Data Synthesis A total of twelve relevant studies (Oxford Centre for Evidence-Based Medicine level 3b) included in this study. The peroneal muscle was less activated in AI compared to control before landing (SMD=-0.59, p<0.01, CIs=-0.91, -0.27). AI had greater peak vertical GRF (SMD=0.21, p=0.03, CIs=0.02, 0.41) and exhibited shorter time to peak vertical GRF (SMD=-0.63, p<0.01, CIs=-0.85, -0.41) than those of control during landing (SMD=-0.63, p<0.01, CIs=-0.85, -0.41).
Conclusions Muscle recruitment training of the peroneal muscle may diminish the risk of the recurrent ankle sprain in addition to other lower limb injuries. The peroneal muscle could provide a sufficient range of plantar flexion to decrease vertical GRF and eversion of the subtalar joint. Therefore, peroneal muscle training may be a key factor to retrain for the altered landing strategy resulting in ankle instability.

108 ASSOCIATION BETWEEN ANKLE SPRAIN HISTORY AND ANKLE SPRAIN INCIDENCE IN NATIONAL BASKETBALL ASSOCIATION GAMES

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Background Ankle sprains have one of the highest recurrence rates among all lower extremity injuries in sports.
Objective Assess the association between ankle sprain history in the past year and incident ankle sprain in games.
Design Retrospective Cohort Study
Setting U.S. National Basketball Association (NBA)
Participants All players who participated in an NBA game over 2 or more seasons from 2013–14 through 2016–17.