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ORIGINAL RESEARCH ARTICLE

Ankle Muscular Proprioceptive Signals' Relevance for Balance Control on Various Support Surfaces

An Exploratory Study

ABSTRACT

Forestier N, Terrier R, Teasdale N: Ankle muscular proprioceptive signals' relevance for balance control on various support surfaces: an exploratory study. *Am J Phys Med Rehabil* 2014;00:00–00.

Objective: The purpose of this study was to test the effect of various unstable support surfaces on the relevance of muscular proprioceptive signals originating from the ankle joint.

Design: Ten healthy subjects were instructed to stand as still as possible on a force plate during 40 secs on three different surfaces: (1) stable, (2) unstable-unspecific (foam), and (3) unstable-specific (inspired from rearfoot anatomy). Muscular vibration was applied on the paraspinals and fibularis muscles. The effects of vibrations on postural stability as well as fibularis longus and tibialis anterior electrical activities for each support condition were investigated.

Results: The unstable-specific support surface was associated with higher fibularis muscular activity and greater postural perturbations when fibularis muscles were vibrated than the unspecific-unstable surface.

Conclusion: Balance control on unstable-specific support surface maintains the relevance on muscular proprioceptive signals originating from ankle and increases ankle evertor muscle activity.

Key Words: Proprioception, Ankle Sprain, Rehabilitation, Balance Control