Effect of Fatigue on Kinesthetic Acuity of Healthy Ankle

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Abstract

The purpose of this study was to determine the effect of fatigue on kinesthetic acuity of (Ankle) the gastrocnemius through a dynamic fatiguing protocol in dorsiflexion and plantar flexion of the ankle. Participants: 100 healthy college students volunteered for the study. Subjects meeting any of the following exclusion criteria were excluded from the study: (1) prior history of multiple ankle sprains, (2) an ankle sprain or ankle injury within the last six months, (3) any knee or ankle surgery within the past year, (4) any neurological or central nervous system deficits (5) taking any medication which might affect the nervous system. Main Outcome Measures: The researchers expected that there would be a significant difference in absolute error between the non-fatigued and fatigued condition at both 10º of dorsiflexion and 20º of plantar flexion. Results: There was significant main effect of fatigue on kinesthetic of healthy ankle. Conclusion: The results of this study indicated that there was significant difference between the non-fatigued and fatigued conditions at 10º of dorsiflexion and 20º of plantar flexion measurements.

Key Words: Kinesthetic Acuity; Fatigue; Ankle; Dorsiflexion; Planter flexion

Introduction

Kinesthetic acuity is defined as ability of perception of one's own body part, weight and movement or the ability of a person to sense by which position, weight and movement are perceived *(Mosby, 2009)*. Proprioception is defined as the awareness of posture, movement, and changes in equilibrium and the knowledge of position, weight and resistance of objects in relation to the body. It is derived from a complex array of information arriving at the brain from several different sources including the muscle spindle, joint capsule, joint ligaments, skin, fat pads, and possibly the joint cartilage and/or subchondral bone. The individual contributions of the various components of proprioception are not well understood, although historically the joint capsule and ligaments were thought to be the major contributors. If indeed the joint capsule and ligaments are the principle contributors to proprioceptive input, it might be expected that persons with damage to their joint capsules or ligaments might have proprioceptive deficits. Joint position sense is a vital component of proprioception. Joint position sense is the body's conscious awareness of joint position and movement resulting from the proprioceptive input to the central nervous system *(Docherty et al, 1999)*. Joint position sense is determined by muscle spindles and skin receptors (*Forestier et al, 2002)*. There have been numerous studies measuring joint position sense in

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