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Science & News

NO 02 2012

Park Se-yeon, Yoo Won-gyu. Differential activation of parts of the serratus anterior muscle during push-up variations on stable and unstable bases of support. Journal of Electromyography and kinesiology 2011; 21: 861-7

Summary:

The study concludes that the lower serratus anterior was activated in a greater extent in a push-up position with unstable surface than on a stable surface. In addition, the study confirmed that the serratus anterior showed greater activity in the push-up plus position than in the standard push-up

Abstract:

No studies have examined the effects of an unstable surface on push-up and push-up plus exercises in terms of the two parts of the serratus anterior muscle. We hypothesized that the lower part of the serratus anterior would have greater activity with an unstable surface, which requires stabilizing the scapular position. The present study was performed to investigate the intramuscular differences between parts of the serratus anterior muscle during push-up and push-up plus exercises. Twelve healthy subjects were included in the study. The upper and lower parts of the serratus anterior and upper and lower parts of the trapezius were investigated by surface EMG during four types of exercise. Repeated one-way ANOVA was used for statistical analyses. Maintaining the push-up plus phase caused significant increases in EMG activity of the upper serratus anterior compared with the push-up ascending phase on both of stable and unstable bases ($P < 0.05$). The lower serratus anterior showed increased activation on an unstable surface, which required more joint stability than did the stable base. Upper trapezius/upper serratus anterior ratio was significantly lower in the PUP than in the PUA phase with both stable and unstable bases of support ($P < 0.05$). Further studies are required to investigate the intramuscular variation in activation of the serratus anterior during exercises for rehabilitation.

Helgadottir H et al. Altered activity of the serratus anterior during unilateral arm elevation in patients with cervical dosorders. Journal of Electromyography and kinesiology 2011;21: 947-53

Summary:

The article concludes that both patients diagnosed with insidious neck pain and WAD demonstrated a significant a significantly delayed onset of muscle activation and less duration of muscle activity of serratus anterior on both sides during arm elevation. This finding may have implication for scapular stability in these patients

Abstract:

Altered activity in the axioscapular muscles is considered to be an important feature in patients with neck pain. The activity of the serratus anterior (SA) and trapezius muscles during arm elevation has not been investigated in these patients. The objectives of this study was to investigate whether there is a pattern of altered activity in the SA and trapezius in patients with insidious onset neck pain (IONP) (n = 22) and whiplash associated disorders (WAD) (n = 27). An asymptomatic group was selected for baseline measurements (n = 23). Surface electromyography was used to measure the onset of muscle activation and duration of muscle activity of the SA as well as the upper, middle, and lower trapezius during unilateral arm elevation in the three subject groups. Both arms were tested. With no interaction, the main effect for the onset of muscle activation and duration of muscle activity for serratus anterior was statistically significant among the groups. Post hoc comparison revealed a significantly delayed onset of muscle activation and less duration of muscle activity in the IONP group, and in the WAD group compared to the asymptomatic group. There were no group main effects or interaction effects for upper, middle and lower trapezius. This finding may have implications for scapular stability in these patients because the altered activity in the SA may reflect inconsistent or poorly coordinated muscle activation that may reduce the quality of neuromuscular performance and induce an increased load on the cervical and the thoracic spine.

Langer N et al. Effects of limb immobilization on brain plasticity. Neurology 2012;17:182-88

Summary:

The study shows that deprivation of the sensorimotor network by immobilization causes specific neuroanatomical changes in the brain. The findings highlight the capacity of the human brain to adapt rapidly to changing demands

Abstract:

Objective: Little is known about the effects of reduced sensory input and motor output in the human brain. Therefore, we conducted a longitudinal study to investigate whether limb immobilization after unilateral arm injury is reflected in structural plastic changes in gray matter (cortical thickness) and white matter (fractional anisotropy [FA]). Methods: We examined 10 right-handed subjects with injury of the right upper extremity that required at least 14 days of limb immobilization. Subjects underwent 2 MRI examinations, the first within 48 hours postinjury and the second after an average time interval of 16 days of immobilization. Based on the MRI scans, we measured cortical thickness of sensorimotor regions and FA of the corticospinal tracts. Results: After immobilization, we revealed a decrease in cortical thickness in the left primary motor and somatosensory area as well as a decrease in FA in the left corticospinal tract. In addition, the motor skill of the left (noninjured) hand improved and is related to increased cortical thickness and FA in the right motor cortex. Conclusions: The present study illustrates that cortical thickness of the sensorimotor cortex and FA of the corticospinal tract changed during right arm immobilization and that these changes are associated with skill transfer from the right to the left hand. Thus, immobilization induces rapid reorganization of the sensorimotor system. Given that limb immobilization is a standard intervention technique in constraint-induced therapy, therapists should be aware of both the positive and negative effects of this intervention

Karandikar N et al. Kinetic Chains: A review of the concept clinical applications. American Academy of Physical Medicine and Rehabilitation 2011;5:739-45

Summary:

The study conclude that kinetic chains has been extensively used in biomechanical engineering for decades. The application of this concept to musculoskeletal medicine and sports injuries enables individualized exercise programs. The article explains the characteristic properties of closed and open kinetic chain exercises

Abstract:

During the past decade, our understanding of biomechanics and its importance in rehabilitation has advanced significantly. The kinetic chain, a concept borrowed from engineering, has helped us better understand the underlying physiology of human movement. This understanding, in turn, has facilitated the development of new and more rational rehabilitation strategies. The kinetic chain concept has application in a wide spectrum of clinical conditions, including musculoskeletal medicine, sports medicine, and neurorehabilitation, as well as prosthetics and orthotics. The purpose of this review is to provide insights into the biomechanics related to the concept of kinetic chains, with a specific focus on closed kinetic chains and its clinical applications in rehabilitation.

The Redcord Conference 2012

We have the pleasure of inviting you to the Redcord Conference 2012. This year the conference will take place September 14th at Thon Hotel Vettre in Asker outside of Oslo.

The Redcord Conference offers important expertise and a unique opportunity to mingle with other therapists from all over the world using Neurac treatment.

We can offer a wide variety of international speakers (all lectures will be held in English). You will be presented the most recent studies, updated knowledge and new experiences from treatment of musculosketelal disorders.

Use the following links get more info about:

- Program
- Speakers
- Practical information (about the hotel, getting there etc)
- Prices and Registration

Developing Redcord golf program

The trainer for many top PGA Tour players, Ben Shear has been working with The Neurac Institute and Redcord USA for about a year, and is now in the process of developing a revolutionizing golf training program in the USA.

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Enormous interest for group therapy

Group exercise therapy has revolutionized the treatment procedure for physiotherapist Yvonne Gjertsen from Norway. In one class, she can treat many people with different problems at the same time. She recently built a group facility at her clinic in Kristiansand, and is now able to treat up to 15 people at the same time. The classes has become so popular that people are traveling long distances to join the classes.

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