

Department of Biomechanics

Doctoral Degree 2014

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Title	:	Effect of Knee Taping on Quadriceps Muscle Performance in Patients with Knee Osteoarthritis
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Degree	:	Doctoral.
Year	:	2014.
Abstract	:	
<p>Background: Patellar taping has long been reported to be effective in relieving pain in patients with patello-femoral pain syndrome. Yet, there is lack of knowledge that supports its use in knee osteoarthritis (OA) management. Purpose: The purpose of the study was to examine the effects of therapeutic patellar taping on concentric and eccentric quadriceps muscle peak torques, VAS pain score, 6-Minute Walking distance, and Stair Ambulation time in patients with generalized knee OA. Methods: Thirty female patients with symptomatic knee OA with mean age 51.8 ± 6.3 years, height 1.62 ± 0.04 m, weight 85.7 ± 10.2 kg, and BMI 32.56 ± 3.26 kg/m² participated in the study. They were tested under three taping conditions that were tested randomly; therapeutic, placebo and no-tape. Data were collected using the Biodex Isokinetic system, Visual Analogue Scale, 6-Minute Walking Test and Timed Stair Ambulation Test. Findings: Repeated measure MANOVA revealed that the quadriceps muscle peak torques and 6-Minute Walking distance increased significantly ($p < 0.05$) and the VAS score and Stair Ambulation time decreased significantly with therapeutic tape use compared with the other two tapes. Moreover, the quadriceps muscle peak torques increased significantly and the VAS score decreased significantly with placebo tape use compared with no tape use, with no significant difference ($p > 0.05$) in-between for the 6-Minute Walking distance and Stair Ambulation time. Interpretation: Therapeutic patellar taping is effective in improving quadriceps strength and functional performance and reducing pain in patients with knee OA.</p>		
Key words	1.	Patellar taping.
	2.	Knee Osteoarthritis
	3.	Quadriceps Strength
	4.	Functional Performance.
Classification number	:	
Arabic Title Page	:	تأثير شريط الركبة اللاصق على أداء العضلة ذات الرؤوس الأربعة لدى مرضى الإلتهاب العظمي المفصلي للركبة
Library register number	:	3993-3994.

Author	:	Ahmed Atteya Ashour
Title	:	Effect of Shoulder-Elbow Joints Positions on Hand Grip Strength and EMG Activities of Wrist Muscles in Normal Subjects
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Degree	:	Doctoral.
Year	:	2014.
Abstract	:	
<p>Purpose: The purpose of this study is to investigate the effect of four different positions of shoulder and elbow joints on the hand grip strength and myoelectric activities of wrist flexors and extensors in normal subjects. Subjects: Thirty normal male university students volunteered to participate in this study. Their mean age, weight and height were 19.6 (\pm 1.06) years, 75.9 (\pm 7.51) Kg and 173.5 (\pm 4.67) cm respectively. Method: Four positions of shoulder (Sh) and elbow (El) joints were assumed during which both hand grip strength and EMG of wrist flexors and extensors were measured and compared. The tested positions were (1) 0° Sh 90° El, (2) 90° Sh flexion 90° El flexion, (3) 90° Sh abduction 0° El, and (4) 90° Sh abduction 90° El flexion. Each subject was instructed to maintain a grip force for 5 seconds during which the raw EMG signals were recorded. Three trials of recording of EMG and grip strength were collected with a rest period of 3 minutes between each trial to prevent fatigue Analysis: One way repeated measures within subject MANOVA was performed using SPSS version 20 with a significance level of 0.05. Results: Statistical analysis revealed that position (3) had significant highest hand grip strength while position (1) recorded the lowest hand grip strength compared to other positions. RMS EMG activities showed that position (3) had highest EMG for both flexors and extensors so this position was taken as reference task for EMG normalization. Wrist flexors % normalized RMS EMG showed no significant difference among the three positions while wrist extensors % RMS EMG has its significant effects when position (1) was compared to (2) and (4). Conclusion: The findings of this study have important implications for the development of wrist and hand injuries in repetitive or prolonged workplace tasks and their rehabilitation especially when the task requires different postures from elbow and shoulder joints.</p>		
Key words	1.	Hand Grip strength,
	2.	EMG
	3.	Upper Limb Posture
	4.	Wrist Muscles
	5.	Ergonomics.
	6.	Hand.
Classification number	:	612.97.AAE
Arabic Title Page	:	تأثير أوضاع مفاصل الكتف والمرفق على قوة قبضة اليد والنشاط الكهربى لعضلات الرسغ فى الأشخاص الأصحاء.
Library register number	:	3745-3746.

Author	:	Lamiaa Kottb Kottb Elsayyad
Title	:	Muscle Imbalance in Patients with Lumbar Spondylosis
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Degree	:	Doctoral.
Year	:	2014.
Abstract	:	
<p>Purpose of the study:The purpose of the current study was to investigate the muscle imbalance in patients with lumbar spondylosis (L.S.).The isokinetic lumbar and hip flexors' and extensors'peak torques were compared in patients with L.S. and healthy subjects. Also, lumbar extensors' and hip flexors' flexibilities were compared in both groups.Materials and methods:Thirty individuals volunteered to participate in the study, 15 patients with L.S. and 15 healthy subjects. Peak torque (PT) data were collected using the Biodex Isokinetic system3at angular velocity of 60°/secfor lumbar muscles and 30°/sec for hip muscles. Concentric contraction mode was used for all assessed muscles.In addition to concentric mode the eccentric mode was used to assess the lumbar and hip extensors. Back extensors' and hip flexors' flexibilities were assessed using modified Schober and modified Thomas tests respectively. Results:Statistical analysis using MANOVA revealed that there was a significant decreasein the mean values oflumbar flexors',lumbar extensors', hip flexors', and hip extensors'concentric PT in patients with L.S.compared withhealthy subjects ($P < 0.05$).There were no significant differences in lumbar and hip extensors' eccentric PT between both groups ($P > 0.05$), with the eccentric PT was lower than the concentric PT of the same muscles. Patients with L.S.showed significant decrease in lumbar flexibility compared with healthy subjects($P < 0.05$) despite being in the normal range in the patients' group. Hipflexors flexibility was normal in both groups.Conclusion:It can be concluded that muscle imbalance may not be considered asa risk factor for L.S.On the other hand, decreased muscular torque affects its stabilizing role and may be considered as one of the L.S. risk factors.</p>		
Key words	1.	Muscle Imbalance
	2.	Lumbar Spondylosis
	3.	Isokinetic
Classification number	:	616.73.ELM
Arabic Title Page	:	اختلال التوازن العضلي في مرضى داء الفقار القطني.
Library register number	:	3627-3628.