

## Department of Biomechanics

Master Degree  
2007

Author	:	Amani Eid Abdel Tawab.
Title	:	Effect of Different Terrain Inclinations on Kinetic and Kinematic Parameters of Ankle Joint During Walking.
Dept.	:	Department of Biomechanics.
Supervisors	1.	Salam Mohamed El-Hafez.
Degree	:	Master.
Year	:	2007.
Abstract	:	<p>The purpose of this study was to investigate the effect of walking up three ramps of different slopes (<math>5^{\circ}</math>- <math>10^{\circ}</math>- <math>15^{\circ}</math>) on the two peaks of the ground reaction force (GRF), the ankle plantar flexion (PF) and dorsi flexion moments (DF) and the angular displacement of the right ankle joint in two different positions. The first position was the right foot inclination, left foot inclination in which both legs were placed on a ramp of the same slope. The second position was the right foot horizontal, left foot inclination in which the right leg was in direct contact with the horizontal ground and the left one was on a ramp. Thirty male students participated in this study. Their mean age, weight and height were 19.95 (<math>\pm 2.56</math>) years, 73.73 (<math>\pm 6.44</math>) Kg and 175.33 (<math>\pm 3.50</math>) cm respectively. Each student was asked to walk up the three ramps in both positions. Data collection was carried out using the 3-D Motion Analysis System in conjunction with a force platform. The subjects were instructed to perform three trials during walking up each slope in the first and the second positions. Results revealed that in the first position there was no significant difference among the three tested ramps for each of the two peaks of the GRF. There was also no significant difference in the mean value of the ankle PF moment among the three tested ramps while there was a significant increase in the mean value of the ankle DF moments occurred at ramp <math>10^{\circ}</math> in relation to ramp <math>5^{\circ}</math> &amp; ramp <math>15^{\circ}</math> reaching its minimum value at a ramp of <math>5^{\circ}</math>. In addition, in the second position there was a significant increase in the mean value of the 2<sup>nd</sup> peak of the GRF occurred at ramp <math>15^{\circ}</math> in relation to ramp <math>5^{\circ}</math>. While there was no significant difference among the three tested ramps for each of the ankle PF/DF moments. Consequently, it was concluded that walking up a ramp of <math>5^{\circ}</math> is much more preferable than walking up ramp of either <math>10^{\circ}</math> or <math>15^{\circ}</math>. This to decrease the demand on the dorsiflexors.</p>
Key words	1.	Inclined Surfaces.
	2.	GRF.
	3.	Ankle Moments.
	4.	Gait.
Arabic Title Page	:	تأثير زوايا ميل السطح المختلفة على التحليل الكينماتيكي والكينماتيكي لمفصل الكاحل أثناء المشي.
Library register number	:	1519-1520.

**ELECTRONIC GUIDE TO THESES APPROVED BY  
DEPARTMENT OF BIOMECHANICS  
PREPARED BY NERVEEN ABD EL SALAM ABD EL KADER AHMED**

<b>Author</b>	:	Ghada Abd El Moneim Mohamed Ali.
<b>Title</b>	:	Effect of Different Work-Rest Schedules on Functional Performance and Myoelectric Activity of Wrist Muscles in Computer Users.
<b>Dept.</b>	:	Department of Biomechanics.
<b>Supervisors</b>	1.	Ghada Mohamed El-Hafez.
<b>Degree</b>	:	Master.
<b>Year</b>	:	2007.
<b>Abstract</b>	:	
<p>This study was conducted to explore the changes that may occur in the performance and the myoelectric activity of the wrist flexors and extensors in computer users as a result of applying three different work rest schedules. The studied work rest schedules were; 60min work /10 min rest (long infrequent), 30 min work /5 min rest (long frequent) and 15 min work /2.5 min rest (short frequent). Surface EMG (BIOPAC) of the wrist flexors and extensors were recorded during typing. The study was conducted with thirty data entry operators of both sexes as participants. At each work rest schedule, subjects were instructed to type for a total working period of 1 hour and a 10 min rest break. The results of the study showed significant difference between the three examined work rest schedules for the percentage of normalized EMG activity of the wrist flexors and extensors. The 15/2.5 min schedule followed by the 30/5min schedule resulted in the lower level of muscle activity in relation to the 60/10 min schedule. Although the difference between the levels of the accuracy of performance at the three schedules was insignificant, the highest level was recorded at the third schedule while the lowest level recorded at the first schedule. It was concluded that, the short frequent rest breaks from continuous computer mediated work have a benefit in reducing muscle load. Also it may cause better effect in performance if the subjects addict to use it without interruption of their works. So, the break should be integrated with the task demand to gain more benefits.</p>		
<b>Key words</b>	1.	Work-rest schedules.
	2.	Functional Performance.
	3.	Myoelectric activity.
	4.	Wrist muscles.
	5.	Computer users.
<b>Arabic Title Page</b>	:	تأثير الجداول الزمنية المختلفة للعمل و الراحة على الأداء الوظيفي و النشاط الكهربى لعضلات الرسغ لمستخدمى الكمبيوتر.
<b>Library register number</b>	:	1539-1540.

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DEPARTMENT OF BIOMECHANICS  
PREPARED BY NERVEEN ABD EL SALAM ABD EL KADER AHMED**

<b>Author</b>	:	Lamiaa Kotb EL-Sayyad.
<b>Title</b>	:	Effect of Backpack Carrying Systems on Gait Kinetics in Idiopathic Scoliotic Patients.
<b>Dept.</b>	:	Department of Biomechanics.
<b>Supervisors</b>	1.	Salam Mohamed El-Hafez.
	2.	Hatem A.R.A. Sharf El-Din.
	3.	Nagui Sobhy Nassif.
<b>Degree</b>	:	Master.
<b>Year</b>	:	2007.
<b>Abstract</b>	:	
<p>The purpose of this study was to investigate the effect of different backpack carrying systems on hip and knee peak abductor moments in idiopathic scoliotic patients during gait. The carrying systems were bilateral carrying, unilateral carrying (ipsilateral and contralateral to the scoliotic side) and two sac carrying. Twenty scoliotic patients were matched in age, gender and physical activity level with twenty normal subjects participated in this study. Three D motion analysis system and force plat were used for data collection. The results showed that, during free walking without backpack there was significant increase in the hip abductor moment contra-lateral to scoliotic side. While no significant difference was found between scoliotic ipsilateral side and normals. It was found that using unilateral carrying systems by scoliotic patients significantly increased the hip abductor moment contralaterally. The knee and hip abductor moments showed the least increase during using the two sac carrying system. The comparison between the both sides of scoliotic patients revealed that, unilateral carrying contralateral to the scoliotic side is the system which restores the balance of moment values obtained from the ipsilateral and the contralateral sides. Unfortunately this carrying system caused significant increase in the knee abductor moment contralateral to the scoliotic side in comparison with the other carrying systems. It was concluded that the two sac carrying was the least stressful on the hip and knee, while symmetry between moments acting on both sides of the pelvis was achieved at the hip during unilateral carrying contralateral to the scoliotic side which consequently may decrease the amount of spinal malalignment.</p>		
<b>Key words</b>	1.	Scoliosis.
	2.	Gait.
	3.	Moment.
	4.	Backpack.
	5.	Carrying.
<b>Arabic Title Page</b>	:	تأثير أنظمة حمل حقيبة الظهر على كينماتيكية المشي عند مرضى الانحناء الجانبي للعمود الفقري.
<b>Library register number</b>	:	1581-1582.

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PREPARED BY NERVEEN ABD EL SALAM ABD EL KADER AHMED**

<b>Author</b>	:	<b>Nadia Lotfy Radwan Mohamed.</b>
<b>Title</b>	:	<b>Myoelectric Activity of Neck and Back Extensors at Different Hip Flexion Angles During Bridging Exercise.</b>
<b>Dept.</b>	:	<b>Department of Biomechanics.</b>
<b>Supervisors</b>	1.	<b>Salam Mohamed El-Hafez.</b>
	2.	<b>Nagui Sobhi Nassif.</b>
<b>Degree</b>	:	<b>Master.</b>
<b>Year</b>	:	<b>2007.</b>
<b>Abstract</b>	:	<p>When describing exercise therapy, it is important to understand the myoelectric activity in healthy conditions. The purpose of the current study was to evaluate the myoelectric activity of neck and back extensors during one of the commonly used bridging stabilization exercises (supine bridge). The investigated exercise is beneficial to stabilize the lumbar spine region. Although others thought that it might be associated with some loads on the cervical spine. Measuring the myoelectric activity of the trunk muscles can reflect the loads on the spine. So the current study was carried out on thirty healthy male students to explore the changes that may occur in the myoelectric activity of neck and back extensors with changing the hip flexion angle while performing bridging exercise. Four hip joint flexion angles were examined 30°, 40°, 50° and single leg extension. Surface electromyography (EMG) was used to pick up the myoelectric signals from the right and left cervical and lumbar erectorspinae muscles. Results of the study showed a non-significant difference between the mean values of the EMG activity of the examined muscles with changing the hip joint flexion angle, however the mean value of the EMG was lower at 40°, 50° hip flexion. It can be concluded that performing bridging exercise with the hip joint flexed at 40°, 50° may be associated with the lower EMG activity of the neck extensors and so the lower load on the cervical region.</p>
<b>Key words</b>	1.	<b>Bridging exercise.</b>
	2.	<b>myoelectric activity.</b>
	3.	<b>hip flexion angle.</b>
<b>Arabic Title Page</b>	:	<b>النشاط الكهربى للعضلات الباسطة للرقبة والظهر عند زوايا ثنى مختلفة لمفصل الفخذ اثناء تمرين رفع الحوض.</b>
<b>Library register number</b>	:	<b>1537-1538.</b>