

## Department of Biomechanics

### Doctoral Degree 2005

<b>Author</b>	:	<b>Samiah Mohamed Ibrahim.</b>
<b>Title</b>	:	<b>Effect of a comprehensive treatment program in improving gait parameters and energy expenditure in patients with unilateral hip osteoarthritis.</b>
<b>Dept.</b>	:	<b>Department of Biomechanics.</b>
<b>Supervisors</b>	1.	<b>Amira Mohamed El Tohamy.</b>
	2.	<b>Ahmed Hassan Hussein.</b>
	3.	<b>Mustafa Hussein Gad.</b>
<b>Degree</b>	:	<b>Doctoral.</b>
<b>Year</b>	:	<b>2005.</b>
<b>Abstract</b>	:	
<p>The purpose of this study was to examine the effect of two treatment programs, one involving all body segments and one applied only to the affected side of patients with unilateral hip osteoarthritis on their spatial gait parameters and energy expenditure. The study included 40 male patients, they were randomly assigned into two equal group. Group 1 received a comprehensive physical therapy program for all body segments while group 2 received localized treatment for affected side only. The study also included 20 healthy volunteers' subjects for comparison. The measurement of gait parameters was conducted by using foot print method, while the oxygen consumption was measured by using the oxygen analyzer (Oxycon 3). The results showed that both treatment programs achieved significant improvement in the measured gait parameters. Oxygen consumption decreased significantly in both groups. However, comparison between the two groups showed that group 1 achieved significant results than group 2. That indicates that treatment programs which include all body parts are more favorable in treating OA hip.</p>		
<b>Key words</b>	1.	<b>Hip joint.</b>
	2.	<b>Oxygen consumption.</b>
	3.	<b>Osteoarthritis.</b>
	4.	<b>Gait.</b>
	5.	<b>Exercise.</b>
<b>Arabic Title Page</b>	:	<b>تأثير برنامج علاجي شامل على مقومات حركة المشى واستهلاك الاكسجين فى المرضى المصابين بالتهاب عظمى مفصلى فى أحد مفصلى الفخذ.</b>
<b>Library register number</b>	:	<b>1167-1168.</b>

**ELECTRONIC GUIDE TO THESES APPROVED BY  
DEPARTMENT OF BIOMECHANICS  
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<b>Author</b>	:	Soheir Mohamed Abd EL-Rahman.
<b>Title</b>	:	Influence of sudden unexpected loads on trunk muscles response in normal individuals and low back pain patients.
<b>Dept.</b>	:	Department of Biomechanics.
<b>Supervisors</b>	1.	Mohamed Foad Ibrahim Khalil.
	2.	Nadia Abd El Azim Fiaz.
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<b>Degree</b>	:	Doctoral.
<b>Year</b>	:	2005.
<b>Abstract</b>	:	<p>The purpose of this study was to clarify how trunk muscles respond to unexpected loads and identify the differences between patients with mechanical LBP and normal subjects as regarding to muscles pattern response to sudden unexpected loads. Also to determine the change in the trunk flexion angle in response to this load. Forty male subjects participated in this study and were classified into two equal groups (twenty patients with mechanical LBP and twenty normal control subjects). Each subject was asked to stand on the ground in the cameras field with extended knee and flexed elbow at the level waist to catch the falling weight. Another person stood in front of him and holds briefcase with unknown weight at the level of the subject shoulder and suddenly dropped it on the subject hands. The raw surface EMG signals were recorded using surface EMG electrodes from erector spine and rectus abdominals muscles (right and left) during, (1) maximum isometric voluntary contraction (MIVC), (2) unexpected trunk loading with 3 different weights (2 kg, 7 Kg, and 10 Kg), (3) expected trunk loading with 3 different weights (2 Kg, 7 Kg, and 10 Kg). The trunk flexion angle was measured simultaneously with the EMG activities during the previous experimental conditions by using Qualisys motion analysis system. The results of this study indicated that during sudden unexpected trunk loading there was increased trunk muscle response and trunk flexion angle (trunk displacement) compared with expected loading condition. The results also revealed that patients with mechanical LBP, contrary to normal subjects, demonstrated a significant increase in muscle response pattern in response to sudden load. These differences may either constitute a predisposing factor to low back injuries or a compensation mechanism to stabilize the lumbar spine.</p>
<b>Key words</b>	1.	LBP (low back pain).
	2.	Unexpected load.
	3.	Electromyography.
	4.	trunk muscles.
<b>Arabic Title Page</b>	:	تأثير الأحمال غير المتوقعة علي استجابة عضلات الجذع في الأشخاص الأصحاء و مرضي الام أسفل الظهر.
<b>Library register number</b>	:	1141-1142.