Department of Biomechanics

Master Degree
2005

Author	**:**	**Amal Abd El Rahman Mohamed Abd El Rahman.**
Title	**:**	**Myoelectric Activity of Neck Extensors with the Change of the Angle of Writing Arm Support during Sitting.**
Dept.	**:**	**Department of Biomechanics.**
Supervisors	**1.**	**Mohamed Fouad Ibrahim.**
	2.	**Ghada Mohamed El-Hafez.**
	3.	**Salam Mohamed El-Hafez.**
Degree	**:**	**Master.**
Year	**:**	**2005.**
Abstract	**:**	

The purpose of this study was to explore changes that may occur in the myoelectric activity of four chosen neck extensor muscles due to changing the angle of the writing arm support between 0°, 10°, and 20° slopes. The studied muscles were; right and left semispinalis capitis and cervicis (Rt and Lt SCC), right and left upper trapezius (Rt and Lt UT). Surface EMG (BIOPAC) of these four muscles was recorded from a group of 30 healthy male students with an average age of 19.3 years (±1.8). The results of the study showed a non significant difference between the percentages of normalized EMG activity of the neck extensor muscles between the 3 examined slopes. However, the mean value of the percentage of normalized EMG activities of the Rt upper trapezius showed a significant difference between slope 0° and slope 20°. It was concluded that the EMG activity of the neck extensor muscles is not affected by slight variations of the inclination angle of the writing arm support. Changes in the level of activity of the upper trapezius muscle appear in larger variations between slopes, as the 0° and 20° slopes.

Key words	**1.**	**Myoelectric activity.**
	2.	**writing arm support.**
	3.	**neck extensor muscles.**
Arabic Title Page	**:**	**النشاط الكهربي للعضلات الباسطه للرقبة مع التغير فى زاوية ساند ذراع الكتابة أثناء الجلوس.**
Library register number	**:**	**1173-1174.**

Author	**:**	**Amira Abdallah Abd El Megeid Abdallah.**
Title	**:**	**Effect of a Specifically Designed Computer Mouse Platform on Wrist Positions and Myoelectric Activity of Wrist Muscles.**
Dept.	**:**	**Department of Biomechanics.**
Supervisors	**1.**	**Mohamed Fouad Khalil.**
	2.	**Ghada Mohamed El Hafez.**
	3.	**Salam Mohamed El Hafez.**
Degree	**:**	**Master.**
Year	**:**	**2005.**
Abstract	**:**	

The purpose of this study was to investigate the effect of using four different computer mouse platform slopes on the wrist radial/ulnar deviation and extension/flexion postures and the myoelectric activity of the wrist extensors and flexors. The four computer mouse platform slopes tested were; two horizontal slopes (with and without forearm support), and two downward tilted slopes of 10˚ and 20˚. Thirty male students participated in this study. Each student conducted a 'point and click' computer mouse task for 30 minutes at each of the four computer mouse platform slopes, with each slope tested at a separate day. Wrist radial/ulnar deviation and extension/flexion postures' data and wrist extensors' and flexors' surface EMG data were collected before and after task performance. Results revealed that computer mouse use at the 10˚ downward tilted slope was associated with the least myoelectric activities of the specified muscles with minimal degrees of wrist joint deviations. Consequently, it was concluded that computer mouse use at a 10˚ downward tilted computer mouse platform slope is much more preferable than its use at any of the other three slopes. This is to reduce the computer related musculoskeletal disorders.

Key words	**1.**	**computer mouse platform slope.**
	2.	**Electromyography.**
	3.	**wrist muscles.**
	4.	**wrist positions.**
	5.	**computer mouse use.**
Arabic Title Page	**:**	**تأثير استخدام تصميم خاص لقاعدة فأرة الكمبيوتر على أوضاع مفصل الرسغ و النشاط الكهربي لعضلات الرسغ.**
Library register number	**:**	**1177-1178.**

Author	**:**	**Eman Zekry Khaled.**
Title	**:**	**Electromyography of Back and Abdominal Muscles at. Different Trunk Inclination Angles during Pushing for Normal Individuals.**
Dept.	**:**	**Department of Biomechanics.**
Supervisors	**1.**	**Mohamed Fouad Khalil.**
	2.	**Salam Mohamed El Hafez.**
	3.	**Nagui Sobhi Nassif.**
Degree	**:**	**Master.**
Year	**:**	**2005.**
Abstract	**:**	

The objective of this study was to investigate the effect of assuming different trunk inclination angles on the myoelectrical activity of the erector spinae (ES) and the rectus abdomens (RA) muscles in normal subjects during the pushing activity. Forty normal subjects participated in this study (20 males and 20 females). They were asked to push a cupboard weighing about 300/0 of his/her weight at different trunk inclinations (0°, 20°, 40°). At each time the EMG activities of both RA and ES were recorded. The results revealed that by increasing the trunk inclination the EMG activities of both RA and ES increases and consequently the load falling on the low back area. So, it may be of mechanical advantage to push with trunk flexion more than 45° (beyond mid range of trunk flexion) to keep the body's C.O.G as close as possible to the pushed object to decrease the moment arm between the pushed object and the spine and consequently decrease the load falling over the back.

Key words	**1.**	**EMG.**
	2.	**Pushing.**
	3.	**Pulling.**
	4.	**Trunk Muscles.**
	5.	**Angle .**
Arabic Title Page	**:**	**النشاط الكهربي لعضلات الظهر والبطن عند زوايا مختلفة لميل الجذع أثناء الدفع.**
Library register number	**:**	**1225-1226.**

Author	**:**	**Radwa Eid Sweif.**
Title	**:**	**Effect of Using Selected Foot Orthoses on Foot Pressure Distribution in Patients with Hallux Valgus.**
Dept.	**:**	**Department of Biomechanics.**
Supervisors	**1.**	**Mohamed Fouad Ibrahim Khalil.**
	2.	**Salam Mohamed Elhafez.**
	3.	**Nagui Sobhi Nassif.**
Degree	**:**	**Master.**
Year	**:**	**2005.**
Abstract	**:**	

This study aimed to investigate the changes of foot pressure distribution under normal foot and Hallx Valgus (HV) foot. Also this study was conducted to investigate the best type of orthoses prescribed for HV patients from biomechanical point of view. The study was conducted on 30 normal subjects and 30 HV patients. Measuring average force and maximum pressure under the foot, using "Foot Scan" instrument. The HV group walked on the platform four times; first walking bare footed, second walking with wearing the first type of orthoses (separator), third wearing the second type of orthoses (bunion comforter) and fourth wearing both types of orthoses together. Comparisons done between the five different foot situations using ANOV A revealed that there was significant differences between pressure distribution of normal foot and HV foot. It is concluded that there is a change in pressure distribution in HV patient during walking when using the selected foot orthoses. Using separator orthosis may enable HV patient to walk as normally as in normal subjects.

Key words	**1.**	**Foot Orthoses.**
	2.	**Pressure Distribution.**
	3.	**Hallux Valgus.**
Arabic Title Page	**:**	**اثر استخدام جبائر مختارة للقدم على توزيع الضغط في القدم في مرضى انحراف الاصبع الاكبر الي الخارج.**
Library register number	**:**	**1217-1218.**

Author	**:**	**Rania Reffat Ali Ahmed.**
Title	**:**	**Correlation between Neck Proprioception Deficit and Balance in chronic Mechanical Neck Pain.**
Dept.	**:**	**Department of Biomechanics.**
Supervisors	**1.**	**Awatef Mohamed Labib.**
	2.	**Hamed Hussein Elgendy.**
Degree	**:**	**Master.**
Year	**:**	**2005.**
Abstract	**:**	

Back ground: Patients with chronic mechanical neck pain showed larger sway areas in standing posture and reduced ability to successfully execute more challenging balance tasks. The purpose of the study was to determine the correlation between neck proprioception defect and balance in chronic mechanical neck pain patients. Subjects: Thirty subjects (13 Females and 17 Males); mean age was (41.5 ~3.7). They were referred nom out clinic of the Faculty of Physical Therapy, suffering from chronic mechanical neck pain (neck pain persisted more than three month). The neck proprioception accuracy level was measured by using CROM device and balance was measured by using Biodex stability system. Results: Active neck repositioning accuracy level was poor in patient with chronic mechanical neck pain. Also balance was disturbed in the same group. There was a statistically significant correlation between cervical proprioception deficit and balance in patient with chronic mechanical neck pain. Conclusion: it is indicated that the proprioception acuity is disturbed in patient with chronic mechanical neck pain. This deficit led to balance disturbances among these patients. This study recommended proprioceptive and balance rehabilitation programs among treatment plan of chronic mechanical neck pain.

Key words	**1.**	**chronic mechanical neck pain.**
	2.	**Proprioception.**
	3.	**Balance.**
Arabic Title Page	**:**	**العلاقة بين اضطراب المستقبلات الحسية العميقة في الرقبة والاتزان في حالات الآلام العنقية الميكانيكية المزمنة.**
Library register number	**:**	**1209-1210.**

Author	**:**	**Walaa Hamdy Ahmed Elsayed.**
Title	**:**	**Effect of extremely low frequency magnetic field on mechanical properties of red blood cells in rats.**
Dept.	**:**	**Department of Biomechanics.**
Supervisors	**1.**	**Awatif Labib.**
	2.	**Fadel Mohamed Ali.**
Degree	**:**	**Master.**
Year	**:**	**2005.**
Abstract	**:**	

Magnetic therapy is considered to be a noninvasive method for treatment of many pathological conditions. Many trials have been carried out to reveal the effect of magnetic field on different body systems but, mechanism of action of magnetic field still not clear. This study was conducted to investigate the effect of prolonged exposure to 50 Hz-1gauss (G) magnetic field on osmotic fragility, morphology of RBCs, and blood viscosity of rats. Twenty healthy male albino rats were used with average weight 130±20 gram (g) and age 2-2.5 months. Animals were divided into 2 equal groups; experimental, and control. Experimental group was exposed to MF for 21 days, 6 hours/ day. Control group was not exposed to any field. Osmotic fragility, morphology of RBCs, and blood viscosity were measured for all animals' pre exposure, immediately post exposure, and 45 days post exposure for delayed effect studies. The data were statistically analyzed using t test and ANOVA. The results revealed that exposure of the animals to 50Hz-1G MF resulted in significant decrease of RBCs membrane elasticity and permeability as well as irregularity of the cellular membrane. There was significant increase in the blood viscosity after exposure to MF (P< 0.0001), with a percentage of difference of 62.9%. Delayed measurement showed that the newly generated RBCs still affected, reflecting the injuries in the hemopoetic system, while, there was significant increase in the blood viscosity (P<0.0001), with a percentage of difference 43.47%. It was concluded that prolonged exposure to ELF MF has hazardous effects on RBCs membrane, and also affecting blood viscosity, therefore it may be hazardous to physiotherapists.

Key words	**1.**	**extremely low frequency magnetic field (ELF MF).**
	2.	**RBC (Red Blood Cells).**
	3.	**osmotic fragility.**
	4.	**blood viscosity.**
	5.	**rats.**
Arabic Title Page	**:**	**تأثير المجال المغناطيسي ذو تردد شديد الانخفاض على الخصائص الميكانيكية لخلايا الدم الحمراء في الفئران.**
Library register number	**:**	**1137-1138.**