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VARIATION IN SHOULDER ROTATORS TORQUE PRODUCTION IN THE SCAPULAR AND FRONTAL PLANES

By

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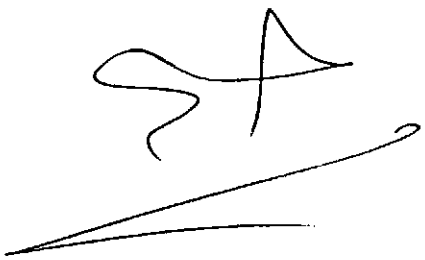

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Dedication

To my family , Without their support and love , I could not complete this work

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Above all and befor all thanks to GOD

First and above all, I pray thanking **GOD** for his blessings and giving me the patience and effort to achieve this work.

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Abstract

Background: Isokinetic dynamometry has been employed for assessing the performance of volunarily contracting muscle. Isokinetic testing may produce a variety of different muscle performance data. For example, torque , peak torque, work and power. Peak torque is the most representative and widely used parameter to evaluate muscle function.**The purpose:** To compare torque production in the scapular and frontal planes during isokinetic testing of shoulder rotators and to determine the most efficient position for strength training and therefore rehabilitation of shoulder rotators. **Design and subjects:** Single repeated measurement design was used. Thirty healthy female of physical therapy students and employees participated in this study, their age ranged between 18-32 years. Methods: All testing was performed by a single investigator and all subjects were tested both in the scapular and frontal planes for each rotational movement. Subjects were randomly assigned to either plane for initial testing. Each subject performed 3 trials of concentric isokinetic shoulder internal and external rotation in the frontal and scapular planes. The mean peak torque of the three trials was measured. Paired t-test was used to distinguish between shoulder rotators torque production in the scapular and frontal planes. **Results:** The results revealed that there was significant difference in shoulder internal rotators torque in the scapular and frontal planes. The torque generated by the shoulder internal rotators was significantly greater in the scapular than in the frontal plane ($p<0.014$) and there was also significant difference in shoulder external rotators in the scapular and frontal planes. The torque generated by shoulder external rotators was significantly greater in the scapular plane than in the frontal plane ($p<0.0001$). **Discussion and conclusion:** The findings revealed that torque generated by shoulder internal and external rotator muscles during concentric isokinetic contraction varies according to shoulder joint testing position and isokinetic shoulder strengthining and testing should be performed in the scapular plane.

Key Words : Isokinetic, Shoulder rotators , Torque

LIST OF ABBREVIATIONS

APM	Angle of peak moment
ATP	Adenosin triphosphate
CON	Concentric
ECC	Eccentric
GHI	Glenohumeral joint
ICC	Intraclass correlation coefficient
IPA	Isometric preactivation
IROM	Isokinetic range of motion
LOA	Limits of agreement
MAP	Moment angular position
MVIC	Maximum voluntary isometric contraction
N.M	Newton.Meter
PAV	Preset angular velocity
PM:AM	Peak to average moment ratio
PT	Peak torque
SIG	Significance
TMO	Transient moment oscillations

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