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## Association of quadriceps torque with lower extremity dysfunction in women with early degrees of knee osteoarthritis (OA)

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**Purpose:** The purpose of this study was to investigate whether or not there is an association between concentric and eccentric torque of quadriceps muscle with lower extremity dysfunction represented by WOMAC including (pain, knee stiffness and physical function) in women with early stages of knee OA.

**Backgrounds/Significance:** Osteoarthritis (OA) is a progressive and disabling joint disease. Quadriceps weakness is a hallmark impairment of knee osteoarthritis and the symptoms of knee OA are attributed to it. However, few studies have evaluated this relationship in a population with early stages of knee OA especially in women.

**Subjects:** Forty females patient represented their mean age ( $50.05 \pm 4.006$ ) years, mean weight ( $82.13 \pm 8.16$ ) Kg, mean height ( $158.07 \pm 7.25$ ) Cm and mean BMI ( $30.5 \pm 4.86$ ) Kg/m<sup>2</sup>, with knee OA grades I or II (according to Kellgren and Lawrence criteria) participated in this study.

**Methods & Materials:** The concentric and eccentric quadriceps torque were assessed using a biodex isokinetic dynamometer, multi-joint system 3, at a speed of 90°/s. Self-reported symptoms and disability were assessed using the WOMAC questionnaire.

**Analyses:** Spearman's r correlation coefficients was used to analyze the relationship between the dependent variables (WOMAC subscales for pain, stiffness and physical function) and the independent variables (the normalized mean peak concentric and eccentric quadriceps torques). Significance level set at  $p < 0.05$  for all comparisons.

**Results:** The results of this study demonstrated that there is strong negative correlation between the concentric quadriceps torque and pain ( $r = -0.68$ ,  $p < 0.001$ ) and physical function ( $r = -0.63$ ,  $p = 0.011$ ) but poor negative correlation among the concentric quadriceps torque and stiffness ( $r = -0.25$ ,  $p = 0.11$ ). Eccentric quadriceps torque presented a moderate and negative correlation with pain and physical function of the two subscales of the WOMAC ( $r = -0.50$  to  $0.53$ ,  $p < 0.05$ ). with poor correlation with stiffness ( $r = -0.28$ ,  $p = 0.07$ ).

**Conclusions:** It can be concluded that the concentric and eccentric quadriceps torque is significantly correlated with self-report symptoms of patients (pain and physical function) in initial stages of knee OA with poor correlation between the concentric and eccentric quadriceps torque stiffness.

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