

RELATION BETWEEN Q-ANGLE AND CLINICAL, RADIOGRAPHIC AND ULTRASONOGRAPHIC FINDINGS IN FEMALE PATIENTS WITH SYMPTOMATIC PRIMARY KNEE OSTEOARTHRITIS

Mona Mokhtar El-Bardawil, Marwa Mohamed Hassan, Mohamed Mahmoud Abdel-Hamid El-Shafei,* Hoda Mohamed Aly Abdel-Naby, Maha EL-Sayed Sharaf Eldeen
Department of Physical Medicine, Rheumatology and Rehabilitation, Department of Radio Diagnosis,* Faculty of Medicine, University of Alexandria

Introduction

Q-Angle is an important biomechanical factor in assessing the knee joint function. Primary knee osteoarthritis (KOA) is more common in females owing to many factors including increased Q-Angle. Studying the complex biomechanics of the knee joint is essential to diagnose and hence properly treating joint pathology conservatively.

Aim of the work

The aim of this work was to study the relation between Q-Angle and clinical, radiographic and musculoskeletal ultrasonographic (US) findings in female patients with symptomatic primary KOA.

Subjects and Methods

This study had included twenty-five female patients with a mean age of 55.7 ± 4.01 years ranged from 47 to 62 years, collected between June 2018 and October 2019, fulfilling the American College of Rheumatology (ACR) criteria for KOA. Patients were clinically assessed with calculation of the Western Ontario and McMaster Universities Arthritis (WOMAC) index as a functional score. They underwent knee musculoskeletal US examination for evaluation of medial, lateral and inter-condylar distal femoral cartilage thickness and grading. Also conventional radiography of knees were scored using the Kellgren-Lawrence (K-L) grading scale. Spearman's rho was used to assess the association between Q-Angle value and clinical, functional, radiographic and US findings.

Results

The mean Q-Angle measurement was $18.3 \pm 1.99^\circ$. The mean duration of KOA symptoms was (4.86 ± 3.4) years. The mean total WOMAC score was 63.4 ± 10.4 . Radiologically, using K- L scale, 50% of the knees were grade three and 50% were grade four.

The mean thicknesses of the US-measured articular cartilage of the medial, lateral and inter-condylar area were 2.11 ± 0.52 mm, 2.13 ± 0.48 mm, and 2.69 ± 3.40 mm, respectively. The percent of studied knees was (24%, 28%, 16%, 20% and 10%) on US grading ranged from grade one to five respectively. A positive correlation was found between the mean Q-Angle value and the mean duration of disease and crepitus ($r=.286$, $p=.044$; $r= -2.250$, $p= 0.024$), respectively and a negative correlation was found with total WOMAC Score ($r= -.367$, $p=.009$). However, no significant relation was observed between the Q-Angle and other clinical and imaging findings ($p>0.05$).

Table: Radiological and ultrasonographic assessment of the study sample

	No.	%
ACR		
Three	8	16
Four	30	60
Five	12	24
K & L		
G3	23	46
G4	25	50
G5	2	4
US grading		
G0	1	2
G1	12	24
G2	14	28
G3	8	16
G4	10	20
G5	5	10
Medial femoral cartilage thickness		
Mean $\pm$ SD	2.11 ± 0.52	
Min – Max	(1 – 3)	
Lateral femoral cartilage thickness		
Mean $\pm$ SD	2.13 ± 0.48	
Min – Max	(1 – 3)	
Intercondylar area		
Mean $\pm$ SD	2.69 ± 3.40	
Min – Max	(1.2 – 26.0)	
Synovial thickness		
Present	11	22
Absent	39	78
Effusion		
Present	40	80
Absent	10	20
Osteophytes		
Present	47	94
Absent	3	6

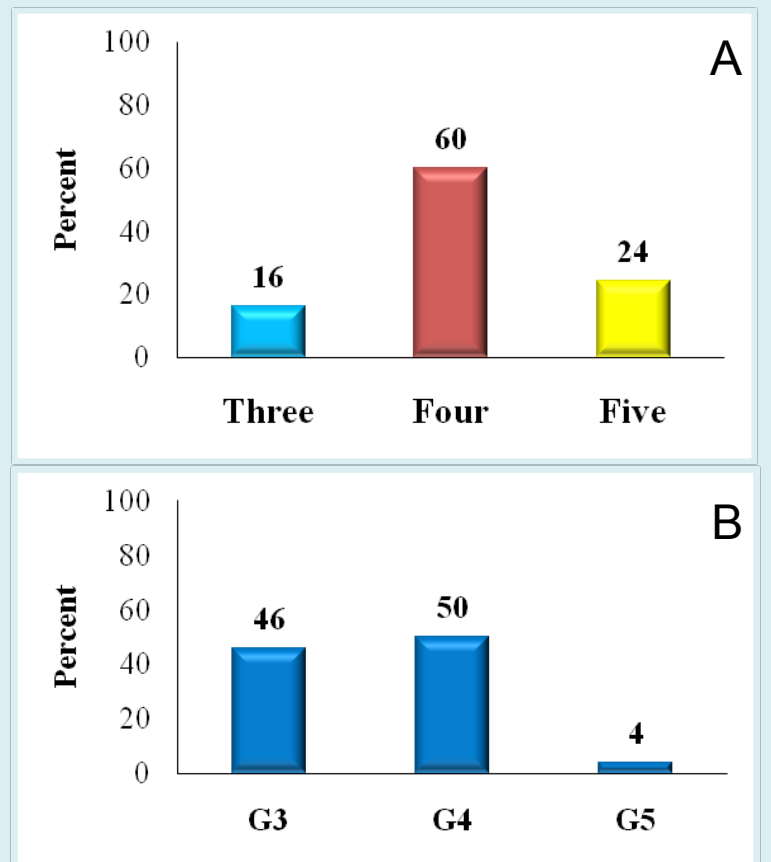


Figure: A) Distribution of the study sample according to ACR
B) Distribution of the study sample according to K & L

Conclusion

The study concluded that Q-Angle was associated with earlier presentation of primary KOA with worsening of functional scores but not with radiographic nor ultrasonographic scores. Thus, Q-Angle measurement provides an objective and quantitative measure for proper diagnosis of KOA.