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Original Research Article

Clinico-radiological correlation of osteoarthritis knee using Western Ontario and McMaster Universities score and Kellegren and Lawrance grading

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ABSTRACT

Background: Diagnosis OA is basically based upon clinical and radiological features. In our study we have used a clinical scoring system of OA called as WOMAC (Western Ontario and McMaster Universities) score and a radiological staging system KL staging (Kellegren and Lawrance) OA radiological staging system and correlation between them.
Methods: There were total 66 patients with 102 knees. X ray of bilateral knee was taken in weight bearing position (standing) and WOMAC score was calculated. X-rays were assessed with KL grading. WOMAC score a clinical scoring was correlated with a radiological KL grading for the OA of knee.
Results: Range of WOMAC score was 11.5-67.7. Mean WOMAC score were 18.75, 31.31, 52.57 and 67.2 in patients of KL grade 1, 2, 3 and 4 respectively. Correlation between KL grading and WOMAC scoring were found to be significant; there were rise in the WOMAC scoring when KL grading increases.
Conclusions: Both the KL grading and WOMAC score are directly proportional to each other, and hence, WOMAC scoring can be used to diagnose, assess the progression of the disease and the response to treatment of osteoarthritis.

Keywords: KL grading, Osteoarthritis knee, WOMAC score

INTRODUCTION

Osteoarthritis (OA) is a degenerative joint disease also known as osteoarthrosis. It is a group of mechanical abnormalities involving degradation of joints including articular cartilage and subchondral bone. OA is the most common form of arthritis[1] and the leading cause of chronic disability. The knee joint is the most common site of OA.[2,3] Clinically the disease is characterized by joint pain, tenderness, limitation of movement, crepitus, occasional effusion and variable degrees of inflammation without systemic effect.[4] Diagnosis is basically based upon clinical and radiological features. In our study, we have used a clinical scoring system of OA called as WOMAC (Western Ontario and McMaster Universities) score and a radiological staging system KL staging (Kellegren and Lawrance) OA radiological staging system and studied the correlation between them.[5,6]

METHODS

Present study is an observational cohort study conducted in the Department of Orthopaedic in medical college. Cases were recruited on the OPD basis. According to the American college of Rheumatogy criteria all patients with complaints of non-traumatic, spontaneous in origin knee pain were included in the study.[7] Patients having secondary OA because of any pathology affecting knee joint, renal, hepatic or malignant disease were excluded. Patients of alcohol or drug abuse, taking any treatment of

OA, sports person were also excluded. An inform consent was taken before including them in the study. We have included 66 patients with 102 knees. X ray of bilateral knee was taken in weight bearing position (standing) and the patient was also asked to fill the WOMAC questionnaire till the film was developed.

X-rays were assessed by Kellegren Lawrence Grading (KL grading) to confirm the grade of the patient. To avoid inter-observer variation grading was assessed by single observer. WOMAC is scored on a best to worst scale, so that lower subscale scores represent less pain, stiffness and better physical function.

This index has gained growing acceptance in OA assessment since 1986. It has three dimension or scales called as pain, stiffness and physical function. The pain dimension or scale includes five subscale asking pain at activity or rest. The stiffness dimension includes two subscales. The function dimension explores the degree of difficulty in 17 activities. A total WOMAC score was calculated and was transformed to a 0-100 scale for ease of interpretation. As the patient complaints increases, the score increases. Both the WOMAC score as well as the KL grading were plotted on a graph and the correlation between these clinical and radiological grading for osteoarthritis was calculated. After the clinical and radiological assessment of OA the patients were treated accordingly.

RESULTS

There were total 66 patients registered out of which, 48 were female and 18 were male. Total 102 knees were examined for OA, X-ray was done and WOMAC score calculated. Patients were of age of 35 to 80 (mean age 55) Numbers of patients according to KL grading 1, 2, 3 and 4 were 9, 30, 51 and 12 respectively.

Table 1: Distribution of patients according to KL grading and mean WOMAC score.

KL grading	No. of patients	Mean WOMAC score
1	9	18.75
2	30	31.31
3	51	52.57
4	12	67.2

Range of WOMAC score was 11.5-67.7. Mean WOMAC score were 18.75, 31.31, 52.57 and 67.2 in patients of KL grade 1, 2, 3 and 4 respectively (Table 1).

On plotting the graph between KL grading and WOMAC scoring we found that there was significant rise in the WOMAC scoring when KL grading increases (Figure 1). As per the statistical analysis is concerned, there was strong positive correlation between them (p =0.000).

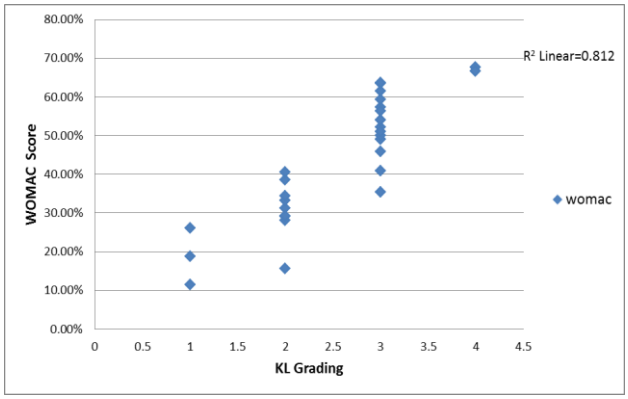

Figure 1: Correlation between KL grading and WOMAC score.

DISCUSSION

OA of the knee has been identified as one of the most prevalent chronic disorder affecting adults and a major cause of discomfort (pain and stiffness) and physical disability that results in extreme use of health care resourses.[8-12] The WOMAC score is widely used and validated three dimensional disease specific self-administered, health status measure assessing pain, stiffness, and function in patients with OA of the knee or hip.[13,14] On the other hand, radiological criteria (KL grading) is considered as gold standard in diagnosis of knee OA. In our study, basically an observational study, we investigated the relation between WOMAC score and radiological KL grading. No significant difference was observed on comparing the age of patients in study. Female sex has been associated with increased reporting of knee pain in some community studies present study also favours that.[15,16] Present study showed significant association between KL grading and WOMAC score of knee i.e. greater the WOMAC score OA was more severe radiologically.

CONCLUSION

The results reported in this study confirm the reliability and validity of the WOMAC score in patients with OA of the knee. Both the KL grading and WOMAC score are directly proportional to each other and hence, WOMAC scoring can be used to diagnose, assess the progression of the disease and the response to treatment of osteoarthritis. It can be concluded that WOMAC scores are significantly associated with knee osteoarthritis and are able to predict the disease severity similar to KL grading with X-ray.

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Annexure

The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)					
0 = None, 1 = Slight, 2 = Moderate, 3 = Very, 4 = Extremely					
Pain:					
1. Walking	0	1	2	3	4
2. Stair Climbing	0	1	2	3	4
3. Nocturnal	0	1	2	3	4
4. Rest	0	1	2	3	4
5. Weight bearing	0	1	2	3	4
Stiffness:					
1. Morning stiffness	0	1	2	3	4
2. Stiffness occurring later in the day	0	1	2	3	4
Physical Function:					
1. Descending stairs	0	1	2	3	4
2. Ascending stairs	0	1	2	3	4
3. Rising from sitting	0	1	2	3	4
4. Standing	0	1	2	3	4
5. Bending to floor	0	1	2	3	4
6. Walking on flat surface	0	1	2	3	4
7. Getting in / out of car	0	1	2	3	4
8. Going shopping	0	1	2	3	4
9. Putting on socks	0	1	2	3	4
10. Lying in bed	0	1	2	3	4
11. Taking off socks	0	1	2	3	4
12. Rising from bed	0	1	2	3	4
13. Getting in/out of bath	0	1	2	3	4
14. Sitting	0	1	2	3	4
15. Getting on/off toilet	0	1	2	3	4
16. Heavy domestic duties	0	1	2	3	4
17. Light domestic duties	0	1	2	3	4
Total Score: _____ / 96 = _____%					