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Medical Science**Journal homepage: www.Sjournals.com**Original article****Correlation between clinical and radiological grading of osteoarthritis****S. Singh*, V. Khanna***Era's Lucknow Medical College, India.*

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ABSTRACT

Primary knee Osteoarthritis is a common condition affecting human beings after fourth decade of life. The diagnosis is based on a) Clinical presentation alone or b) on clinical and radiological findings or c) on clinical presentation, radiological findings and laboratory results. Hence, correlation between clinical scoring and radiological staging is helpful in predicting the severity as well as clinical outcome of the disease. Material and Method, We screened 100 female patients suffering from primary knee pain for atleast 6 months of duration or more. All cases with secondary causes of knee osteoarthritis were excluded from the study. All cases were asked to get an anteroposterior standing radiograph of the involved knee and radiological assessment was done by Kellegren Lawrence grading (K-L grading) method. They were also asked to fill up the WOMAC questionnaire while waiting for the radiograph to develop. The results thus obtained were compared and correlated with the help of Pearson's coefficient of correlation. Results, The mean WOMAC score is found to be 51(max.81, min.17). The better the WOMAC score, the greater grade of severity according to KL grading was obtained. The Pearsons coefficient of correlation was calculated to be +0.904. Conclusion, The result shows a directly proportional relation between WOMAC score and K- L grading. Hence, with accurate history taking and clinical examination as well as WOMAC scoring one can predict the occurrence of knee Osteoarthritis earlier than its radiological appearance. Hence, giving more time to halt the progression of the disease at a much earlier stage when the destruction is at the cartilage level with no or very little bony

destruction.

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1. Introduction

Osteoarthritis (OA), also known as degenerative arthritis or degenerative joint disease or osteoarthrosis, is a group of mechanical abnormalities involving degradation of joints (Osteoarthritis, 2001) including articular cartilage and subchondral bone. Osteoarthritis most often affects middle-age to elderly people. It is commonly referred to as OA or as "wear and tear" of the joints, but we now know that OA is a disease of the entire joint, involving the cartilage, joint lining, ligaments, and bone. OA is one of the leading causes of disability in older people. A variety of causes like developmental, hereditary, metabolic, and mechanical defects may initiate processes leading to loss of cartilage. When bone surfaces become less well protected by cartilage, bone may be denuded and damaged. As a result of decreased movement secondary to pain, regional muscles may atrophy, and ligaments may become more lax. Symptoms may include joint pain, tenderness, stiffness, locking, and sometimes an effusion. This arthritis tends to occur in the hand joints, spine, hips, knees, and great toes. OA symptoms can vary greatly among patients. Diagnosis is made with reasonable certainty based on history and clinical examination (Zhang, et al., 2010; Bierma-Zeinstra et al., 2002). X-rays may confirm the diagnosis. Plain films may not correlate with the findings on physical examination or with the degree of pain (Phillips and Brasington, 2010). Usually other imaging techniques are not necessary to diagnose OA. Clinically OA can be graded with the help of the WOMAC grading which is a direct measure of the severity of symptoms of OA. This can be used as a good screening tool as well as a good way to accurately measure the response to treatment.

1.1. Aims and Objectives

To assess the correlation between clinical grading (WOMAC) and the radiological grading (KL grading) of osteoarthritis of knee.

2. Material and Methods

Out of patients coming to the Era's Lucknow Medical College and hospital with knee pain for more than 6 months, 100 females were selected between the age group of 45-65 years. All of these women were carefully selected after excluding the females having knee pain due to other causes. All cases with past history of trauma, secondary osteoarthritis, any other medical conditions, with any infective or congenital etiology, cases on medication for osteoarthritis, and on non-steroidal anti-inflammatory drugs were also excluded from the study. An informed consent was taken from all before including them in the study. An anterolateral X-Ray of both the knees was taken in weight bearing position (standing) and the patient was also told to fill the WOMAC questionnaire till the X-Ray was developed. Radiographs were assessed the Kellgren Lawrence Grading (KL Grading) to confirm the grade of the patient. All the KL Grading was done by a single observer to avoid inter-observer variation. The KL grading of the knee joint from grade 1-4 is shown in Figure 1. Grade 1- doubtful narrowing of joint space and possible osteophytic lipping (Kellgren and Lawrence, 1957). Grade 2- definite osteophytes, definite narrowing of joint space. Grade 3- moderate multiple osteophytes, definite narrowing of joints space, some sclerosis and possible deformity of bone contour. Grade 4- large osteophytes, marked narrowing of joint space, severe sclerosis and definite deformity of bone contour.

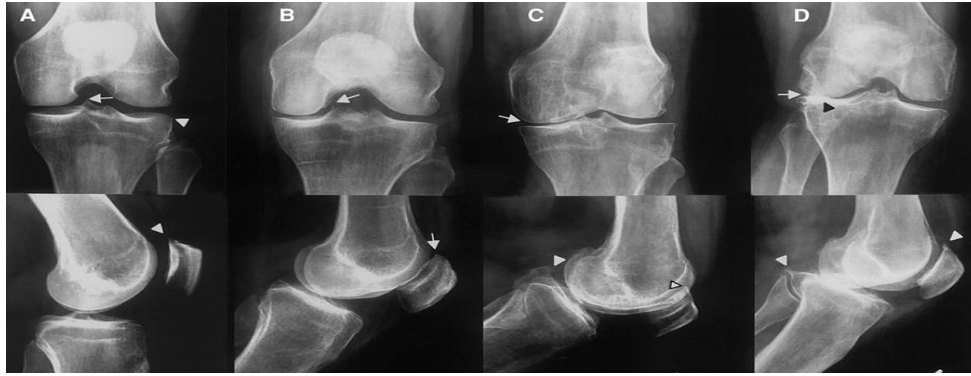


Fig. 1. Anteroposterior (top) and lateral (bottom) radiographs of knees with KL scores of 1-4. A, Knee with a KL score of 1 with minimal osteophytes at the medial femoral condyle (arrowhead in anteroposterior view) and the patellar joint surface (arrowhead in lateral view) and sharpening of the medial tibial spine (arrow). B, Knee with a KL score of 2 with small but definite osteophytes (arrows) but unimpaired joint space (anteroposterior view). C, Knee with a KL score of 3 with moderately impaired joint space (arrow) and osteophytes (arrowheads). D, Knee with a KL score of 4 with substantially impaired joint space (arrow), severe osteophytes (white arrowheads), and sclerosis of subchondral bone (black arrowhead).

The WOMAC questionnaire was filled and the scores were calculated using the WOMAC LK3.1 scoring system (Bellamy and Buchanan, 1997; Bellamy, 1989; Bellamy, 2009). The WOMAC can be self-administered and takes approximately 5 minutes to complete. Patients were asked to answer each question with regard to the pain, stiffness, or difficulty experienced in the previous 48 hours. In particular, the Likert version is simple to use and offers 5 response options ranging from 'none' to 'extreme'. A response of 'none' is scored as 0, 'mild' as 1, 'moderate' as 2, 'severe' as 3, and 'extreme' as 4. Scores for each section are summed to produce pain, stiffness, and physical function subscale scores. The WOMAC is scored on a best to worst scale, so that lower subscale scores represent less pain, less stiffness, or better physical function. A total WOMAC score can also be produced and is commonly transformed to a 0-100 scale for ease of interpretation and comparison with other studies. So as the patients' complains increases the score increases. Both the WOMAC score as well as the KL grading were plotted on a graph and the correlation between them was calculated using the Pearson's Coefficient of Correlation to better assess the correlation between the clinical and radiological grading for osteoarthritis. After the measurement of both the clinical and radiological grading of OA the patient were treated accordingly.

3. Reult

Out of the 100 cases taken the average WOMAC score was calculated to be about 51 with a minimum value of 17 and maximum value of 81. All 4 grades of the KL grading were seen in the X-rays of the patients with the maximum amount of cases in the grade 2 (40%) and the minimum no. of cases in the grade 4 (10%) classification of the KL grading. The WOMAC scoring of osteoarthritis was seen to increase with the increase in the age of the patient as shown in Figure 2. The KL grading also increased with the increase in the age of the patient as shown in Figure 3. With an increase in the KL grading the WOMAC score also increased as shown in Figure 4. The co-efficient of co-relation was found to be +0.904.

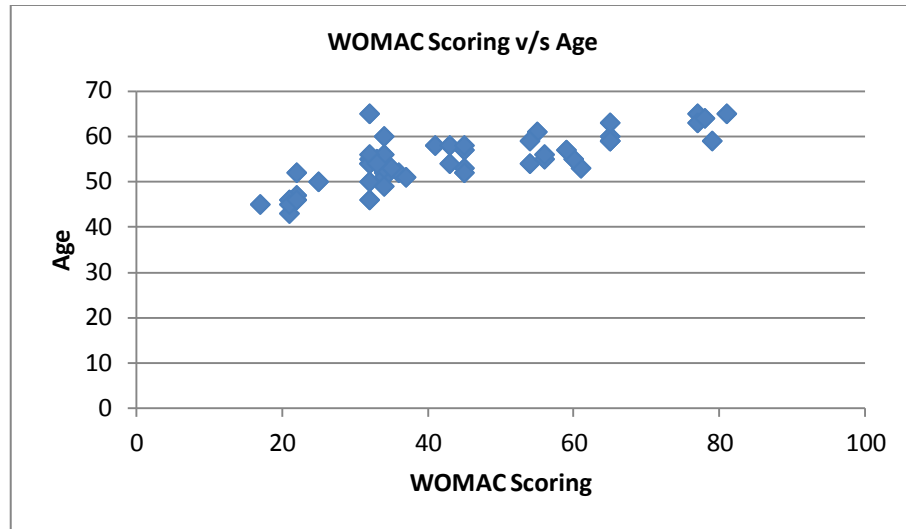


Fig. 2. WOMAC Scoring v/s Age.

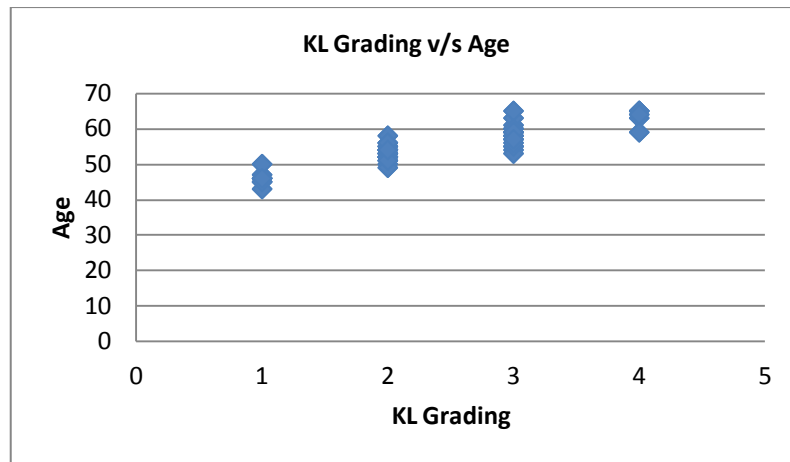


Fig. 3. KL Grading v/s Age.

4. Discussion

We found that both the WOMAC score and the KL grade were associated with age of the patient. They both increased with increasing age of the patient. Only females were chosen for this study to remove any gender bias. There is a strong positive correlation between KL grading and WOMAC Scoring. The results of our study are comparable with Stucki G et al who studied the comparison of metric properties along with validity of German versions of the WOMAC and a self-administered questionnaire-format of the Lequesne-Algorithmic-Index in patients with osteoarthritis (OA) of the lower extremities and concluded that all scales of the WOMAC were internally consistent and associated with radiological OA-severity and joint range of motion (Stucki et al., 1998).

5. Conclusion

Both the KL grade and WOMAC score are directly proportional to each other and hence, WOMAC scoring can be used to diagnose osteoarthritis in poor developing countries where there are limited resources. The WOMAC scoring can also be used for assessing the progression of the disease and the response to treatment. WOMAC scoring can also diagnose cases in early stages when only cartilage damage has occurred; this allows early intervention and better control of osteoarthritis.

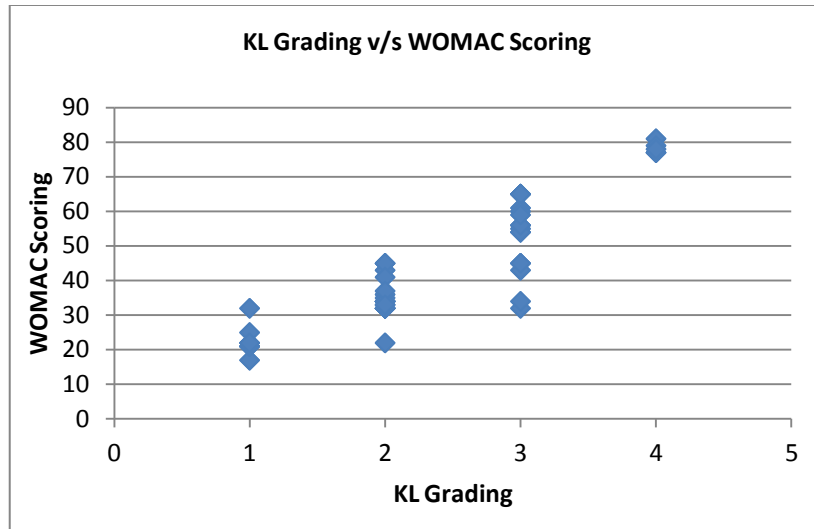


Fig. 4. KL Grading v/s WOMAC Scoring.

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