ISSN NO. 2320-5407

Journal homepage: http://www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

RESEARCH ARTICLE

Association of pain, physical function and radiographic features in Knee Osteoarthritis in Indian population

Dr.Shivananda venkata reddy[1], Dr. Ganesh Arumugam[1], Dr Ajin[1], Dr Ranjith kumar[1] and Dr. Nidhin Jose[2]

1. Bangalore Baptist hospital, Bangalore, India.

2. M S Ramaiah medical college, Bangalore, India.

Manuscript Info

Manuscript History:

Received: 12 November 2013
Final Accepted: 29 November 2013
Published Online: December 2013

Key words:
Knee OA, WOMAC,
Kellgren- Lawrence,
Association.

Abstract

Objectives. Osteoarthritis is one of the commonest knee disorder and also a major problem affecting the Indian population. Assessment of these patients is vital for successfully rehabilitating these patients both therapeutically and surgically. Hence the aim of this study was to investigate the association between Pain, function and radiographic features in patients with knee osteoarthritis (OA) in Indian Population

Patients and Methods. A total of 189 patients with knee OA who attended the physiotherapy clinic in Goldfinch Hospital were included in this study. The patients were diagnosis on the basis of American College of Rheumatology (ACR) criteria for knee OA. Radiographic features were assessed with the Kellgren-Lawrence scale(KLS). The severity of knee pain, stiffness, and disability were measured using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC).

Results. we found that none of the WOMAC sub scores were correlated with Kellgren-Lawrence grading scale ($P < 0.05$).

Conclusions. Hence we concluded that Knee pain, stiffness and functional level are not related with the Radiological features in the patients with knee OA. Therefore treatment of knee OA could be planned according to the clinical features and functional status instead of radiological findings.

Introduction

Osteoarthritis (OA) is the most common type of arthritis and knee OA, being highly prevalent, accounts for as much or more lower extremity disability in community-dwelling older adults than any other disease (1) As a larger proportion of the elderly population in developed countries increasingly lives to an extreme old age, OA will be more prevalent and will be an important cause of disability in the future(2) .The risk of disability increases with the presence of knee pain in the community . Thus it is important to understand the factors which contribute to disability in patients with knee OA. There are some studies which report the relationship between pain and physical functions in patients with knee OA (3)

While considering knee replacement surgeries or rehabilitation clinicians commonly use radiographic tools routinely as part of assessment process. Thus it is very important that the clinicians should have a clear understanding of the relationship between function and radiographic changes. The clinical parameters and radiographic findings are both important in the diagnosis and management of OA. Diagnosis of OA, according to radiological findings without clinical signs of disease, leads to unnecessary drug use in the elderly. Thus it is important to determine the relationships between clinical variables and radiographic findings. In the relevant literature, results have been conflicting as some studies [4] reported no association between pain scores and radiographic features and others [5] found that radiographic features of OA were significantly

associated with knee pain. WOMAC questionnaire is a gold standard tool to assess the pain, stiffness and disability and functional status in patients with Knee OA (6)The Kellgren-Lawrence grading scale (KLS) is a reliable and valid testing tool used in conjunction with radiograph. This method is widely used in the diagnosis as well as in epidemiologic studies on OA of the knee and was accepted by the World Health Organization(7). Few studies have attempted to assess the relationship between radiographic features and functional capacity in patients with Knee OA in Indian population. Hence this study is undertaken to investigate the association of function and radiographic features in OA patients in India.

Methodology

Patients with an history of having bilateral knee pain for a year and were diagnosed as having Knee OA according to American college of rheumatology classification criteria(8) were included in the study. Patients were recruited from Goldfinch Hospital, Bangalore between January 2013 to august 2013. Patients who had inflammatory knee disorders, neoplasm, metabolic bone diseases, systemic illness, other arthropathies, history of knee trauma ,previous surgeries and intra articular injections were excluded form the study.

A total of 180 subjects participated in this cross sectional study. Subjects were 63 males and 117 females . All the patients were referred to the investigator at the outpatient departments of the hospital mentioned above.
The referring physician was aware of the inclusion and exclusion criteria and only patients who fulfilled the criteria were taken for the study. The subjects were first informed about the nature of study and an informed consent was taken from them before the commencement of the study.
The subjects were first asked to fill the WOMAC questionnaire and later weight bearing anterioposterior and lateral radiographs were recorded for both knees in each subject . Each radiograph was evaluated on KLS by an experienced radiologist who was blinded to patients details.

The WOMAC questionnaire is commonly used as an indicator of Knee OA. It is also considered as a gold standard tool to assess the patients functional ability in Knee OA. WOMAC has 3 subcomponents.
Pain is assessed using the pain section of the WOMAC - A . This measure of pain includes 5 summed items and is commonly used as an indicator of
OA knee pain. Total sub score for pain can range from 0 to 20.
Stiffness is assessed using the stiffness subscale of the WOMAC- B which has two items and a total sub score ranging from zero to eight.
Disability and Functional Status-This section evaluates 17 activities (WOMAC C). Subjects rated the degree of difficulty they experienced in the preceding 48 hours for each of the 17 activities using a 5-level numeric verbal descriptor scale with a total sub score ranging from 0 to 68. The activities included in the functions done commonly on a daily basis and are more specific for lower limb function. Higher scores indicate greater levels of difficulty.

The Kellgren-Lawrence grading scale is a reliable and valid assessment tool used associated with radiograph. This method is commonly used in the diagnosis as well as in epidemiologic studies on OA of the knee [9]. The Kellgren-Lawrence scoring used ratings starting from 0 to 4, where 0 = normal radiograph; 1 = doubtful pathology; 2 = minimal osteophytes along with or without possible narrowing, cysts, and sclerosis; 3 = moderate, with features of definite osteophytes with moderate joint space narrowing; 4 = severe, with large osteophytes and definite joint space narrowing.

Results

All Statistical analysis was done using the SPSS package version 12.0. Spearman's product correlation was used to determine the relationship between clinical parameters and radiographic grades in patients with Knee OA. In all analysis p value was set at $p < 0.05$ for statistical significance .

Table 1.Correlation of WOMAC -A and KLS

Spearman's Correlation	**KLS**	**P Value**
WOMAC-A	-0.058	0.05

The above table shows that there is no correlation (r=0.058) between the WOMAC-A & KLS

Table 2.Correlation of WOMAC-B and KLS

Spearman's Correlation	**KLS**	**P Value**
WOMAC-B	-0.116	0.05

The above table shows that there is no correlation (r=0.116) between the WOMAC-B & KLS

Table 3.Correlation of WOMAC-C and KLS

Spearman's Correlation	**KLS**	**P Value**
WOMAC-C	0.174	0.05

The above table shows that there is no correlation (r=0.174) between the WOMAC-C & KLS.

Discussion

In this cross sectional study we investigated if there was any association between pain, function and radiographic features in patients with knee OA. In this study we found that there is no association between Kellgren - Lawrence Grading scale and WOMAC sub scores.

These results may be due to our patients characteristics since they were mostly categorized as mild to moderate for radiographic features in our study. It is possible pain bears a stronger relationship to radiographic features in patients with severe disease. On the other hand conventional radiography which is the most commonly used imaging modality may not identify bony changes related to pain in early OA. Radiographs demonstrate structural changes rather than disease severity. Routine radiographs permits only limited assessment of the three knee compartments, provides only an approximation of articular cartilage change with measurement of joint space narrowing but its relatively poor in characterizing other soft tissues hence leading to lack of association .

In recent studies, it has been shown that the Kellgren-Lawrence score was not related to WOMAC score but that it was important to follow up the progress of the disease [10]. The Framingham Osteoarthritis Study found that 10% of people aged 63 years and over had symptomatic knee OA in the presence of radiographic changes [11].

In our study, we also found more number of female patients with knee OA . This phenomenon could be partly explained that in aging women with the differentiation of the hormonal status and which can lead to imbalance in the formation and destruction of bone. Menopause has been associated with increased production of interleukin-1 which is the part of cytokine response in OA. Also in postmenopausal women as the level of estrogen decreases interleukin-1 levels can increase which leads to OA [12].

Some of the limitations of our study are its cross-sectional design rather than longitudinal follow up and relatively small number of participants who are primarily from urban background. Inclusion of patients from rural background would have given a better picture of a balance of urban and rural communities . Also we used composite scores of joint damage that do not adequately reflect bone changes rather than individual radiographic features. In addition WOMAC scale was the only patient-related data we recorded hence we could not assess the separate contribution of possible confounders that have been associated with pain, disability, and function in knee OA. Further longitudinal research would identify the rate of radiographic progression and its associations with change in pain and function.

Hence we conclude that knee pain, stiffness are not associated with the radiological features in Knee OA. Therefore it would be better to consider mainly the functional status of patients in addition to clinical and radiological findings while planning the treatment of OA patients.

Acknowledgements

The authors of the study would like to acknowledge the help of faculty form Bangalore Baptist Hospital and Goldfinch hospital, Bangalore.

References

1. Guccione AA, Felson DT, Anderson JJ, et al. The effects of specific medical conditions on the functional limitations of elders in the Framingham study. American Journal of Public Health. 1994;84(3):351–358.

2. D. Hammerman, "Clinical implications of osteoarthritis and ageing," Annals of the Rheumatic Diseases, vol. 54, pp. 82–85, 1995.

3. P. Creamer, M. Lethbridge-Cejku, and M. C. Hochberg, "Factors associated with functional impairment in symptomatic knee osteoarthritis," Rheumatology, vol. 39, no. 5, pp. 490–496, 2000.

4. F. Falaffi, F. Cavalieri, M. Nolli, and G. Ferraccioli, "Analysis of disability in knee osteoarthritis. Relationship with age and psychological variables but not with radiographic score," Journal of Rheumatology, vol. 18, no. 10, pp. 1581–1586, 1991.

5. M. Lethbridge-Cejku, W. W. Scott, R. Reichle et al., "Association of radiographic features of osteoarthritis of the knee with knee pain: data from the Baltimore Longitudinal Study of Aging," Arthritis Care and Research, vol. 8, no. 3, pp. 182– 188, 1995.

6. N. Bellamy, W. W. Buchanan, C. H. Goldsmith, J. Campbell, and L. W. Stitt, "Validation study of WOMAC: a health status instrument for measuring clinically important patient relevant outcomes to anti rheumatic drug therapy in patients with osteoarthritis of the hip or knee," Journal of Rheumatology, vol. 15, no. 12, pp. 1833–1840, 1988.

7. H. J. Kellgren and S. J. Lawrence, "Radiological assessment of osteoarthritis," Annals of the Rheumatic Diseases, vol. 16, pp. 494–501, 1967.

8. R. D. Altman, "Criteria for classification of clinical osteoarthritis," Journal of Rheumatology, vol. 18, no. 27, pp. 10–12, 1991.

9. WHO Scientific Group, "Rheumatic diseases," Tech. Rep., WHO, Geneva, Switzerland, 1992

10. T. N. Rupprecht, F. Oczipka, C. L¨uring, P. H. Pennekamp, and J. Grifka, "Is there a correlation between the clinical, radiological and intrasurgical findings of osteoarthritis of the knee? A prospective study on 103 patients," Zeitschrift fur Orthopadieund Unfallchirurgie, vol. 145, no. 4, pp. 430–435, 2007.

11. D. T. Felson, A. Naimark, and J. Anderson, "The prevalence of knee osteoarthritis in the elderly. The Framingham Osteoarthritis Study," Arthritis and Rheumatism, vol. 30, no. 8, pp. 914–918, 1987.

12.David T Felson " The epidemiology of Knee Osteoarthritis: Results from Framingham osteoarthritis Study". Seminars in Arthritis and Rheumatism, Volume 20, Issue 3, (1) Pp 42-50,1990,