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ORIGINAL ARTICLE

Evaluation of profile of patients with osteoarthritis of knee

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ABSTRACT:
Background: The present study was conducted for evaluating profile of patients with osteoarthritis of knee. **Materials & methods:** Present study was conducted on 50 patients with presenting with knee pain and clinical suspicion of osteoarthritis. Complete demographic and clinical details of all the patients was obtained. A Performa was made and complete medical history of all the patients was recorded. All the patients underwent radiographic intervention and radiographic findings were recorded separately. Radiographic and MR imaging findings were compiled as per performa and subjected to analysis using appropriate statistical tests. Assessment was done using SPSS software. **Results:** Majority of patients belonged to the age group of more than 50 years. Mean age of the patients was 55.3 years. 42 percent of the patients were males while the remaining were females. On radiographic assessment, according to Kellgren-Lawrence score, normal findings were seen in 56 percent of the patients while doubtful osteoarthritis was seen in 10 percent of the patients. Minimal to moderate osteoarthritis was seen in 20 percent and 14 percent of the patients respectively. According to MRI findings, normal features appeared in 20 percent of the patients while Intense signal intensity alteration, Defect of cartilage of less than 50%, Defect of cartilage of 50% to 99%, 100% defect of cartilage with no bone ulceration and 100% defect of cartilage with subjacent bone ulceration were seen in 10 percent, 16 percent, 24 percent, 14 percent and 20 percent of the patients respectively. **Conclusion:** MRI plays an important role in imaging the bony and soft tissues of knee as a whole organ, thereby helping in better management and outcome of the disease. Also MRI plays an important role in depicting early changes of osteoarthritis.
Key words: Osteoarthritis, Knee

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INTRODUCTION

Osteoarthritis (OA) is one of the most prevalent condition resulting to disability particularly in elderly population. OA is the most common articular disease of the developed world and a leading cause of chronic disability, mostly as a consequence of the knee OA and/or hip OA. The economic costs of OA are high, including those related to treatment, for those individuals and their families who must adapt their lives and homes to the disease, and those due to lost work productivity. Patients with OA are at a higher risk of death compared with the general population by OR of 1.54.[1-3] History of diabetes, cancer, or cardiovascular disease and the presence of walking disability are major risk factors. Excess mortality is observed for all diseases with specific causes of death but is particularly pronounced for cardiovascular complications. Knee OA is more important not only for its high prevalence rate compared with other types of OA but also for its presentation at earlier age groups particularly in younger age groups of obese women. The incidence of knee OA increases by age and further increase with longer lifetime and higher average weight of the population.[4,5]The most common method for radiographic definition is the Kellgren-Lawrence (K/L) radiographic grading scheme and atlas which has been in use for over four decades. This overall joint scoring system grades OA in five levels from 0 to 4, defining OA by the presence of a definite osteophyte (Grade≥2), and more severe grades by the presumed successive appearance of joint space narrowing, sclerosis, cysts, and deformity. Other radiographic metrics including semi-quantitative examination of individual radiographic features, such as osteophytes and joint space narrowing, or the direct measurement of the inter-bone distance as an indicator of the joint space width in the knees and hips are used to investigate progression in epidemiologic studies and clinical trials of disease modifying therapies.[6-8]Hence; the present study was conducted for assessing profile of patients with osteoarthritis of knee.

MATERIAL AND METHODS

The present study was conducted for assessing profile of patients with osteoarthritis of knee. Present study was conducted on 50 patients with presenting with knee pain and clinical suspicion of osteoarthritis. Complete demographic and clinical details of all the patients was obtained. A Performa was made and complete medical history of all the patients was recorded. All the patients underwent radiographic

intervention and radiographic findings were recorded separately. Radiographic and MR imaging findings were compiled as per performa and subjected to analysis using appropriate statistical tests. Assessment was done using SPSS software.

RESULTS

Majority of patients belonged to the age group of more than 50 years. Mean age of the patients was 55.3 years. 42 percent of the patients were males while the remaining were females. On radiographic assessment, according to Kellgren-Lawrence score, normal findings were seen in 56 percent of the patients while doubtful osteoarthritis was seen in 10 percent of the patients. Minimal to moderate osteoarthritis was seen in 20 percent and 14 percent of the patients respectively.According to MRI findings, normal features appeared in 20 percent of the patients while Intense signal intensity alteration, Defect of cartilage of less than 50%, Defect of cartilage of 50% to 99%, 100% defect of cartilage with no bone ulceration and 100% defect of cartilage with subjacent bone ulceration were seen in 10 percent, 16 percent, 24 percent, 14 percent and 20 percent of the patients respectively.

Table 1: Age-wise distribution

Age group (years)	Number of patients	Percentage of patients
Less than 40	5	10
40 to 50	5	10
51 to 60	12	24
61 to 70	14	28
More than 70	14	28
Total	50	100
Mean	55.3	

Table 2: Gender-wise distribution

Gender	Number of patients	Percentage of patients
Male	21	42
Females	29	58
Total	50	100

Table 3: Distribution of patients according to Kellgren-Lawrence score (on Radiography)

Kellgren-Lawrence score (on Radiography)	Parameter	Number of patients	Percentage of patients
Grade 0	Normal	28	56
Grade 1	Doubtful Osteoarthritis	5	10
Grade 2	Minimal Osteoarthritis	10	20
Grade 3	Moderate Osteoarthritis	7	14
Grade 4	Severe Osteoarthritis	0	0
Total		50	100

Table 4: Distribution of patients according to cartilage abnormality (On MRI)

Grade (On MRI)	MRI Findings	Number of patients	Percentage of patients
Grade 0	Normal	10	20
Grade I	Intense signal intensity alteration	5	10
Grade II A	Defect of cartilage of less than 50%	8	16
Grade II B	Defect of cartilage of 50% to 99%	12	24
Grade III A	100% defect of cartilage with no bone ulceration	7	14
Grade III B	100% defect of cartilage with subjacent bone ulceration.	10	20
Total		50	100

DISCUSSION

Osteoarthritis (OA) a common disease of aged population and one of the leading causes of disability. Incidence of knee OA is rising by increasing average age of general population. Age, weight, trauma to joint due to repetiting movements in particular squatting and kneeling are common risk factors of knee OA. Several factors including cytokines, leptin, and mechanical forces are pathogenic factors of knee OA. In patients with knee pain attribution of pain to knee OA should be considered with caution. Since a proportion of knee OA are asymptomatic and in a number of patients identification of knee OA is not possible due to low sensitivity of radiographic examination.[6-8] Hence; the present study was

conducted for assessing profile of patients with osteoarthritis of knee.

Majority of patients belonged to the age group of more than 50 years. Mean age of the patients was 55.3 years. 42 percent of the patients were males while the remaining were females. On radiographic assessment, according to Kellgren-Lawrence score, normal findings were seen in 56 percent of the patients while doubtful osteoarthritis was seen in 10 percent of the patients. Minimal to moderate osteoarthritis was seen in 20 percent and 14 percent of the patients respectively. According to MRI findings, normal features appeared in 20 percent of the patients while Intense signal intensity alteration, Defect of cartilage of less than 50%, Defect of cartilage of 50% to 99%, 100% defect of cartilage with no bone ulceration and 100% defect of cartilage with subjacent bone ulceration were seen in 10 percent, 16 percent, 24 percent, 14 percent and 20 percent of the patients respectively. Duryea J et al examined the baseline and 12 month visits of a subset of 150 subjects from the OAI. Measurement of radiographic JSW was facilitated by the use of automated software that delineated the femoral and tibial margins of the joint. Measures of medial compartment minimum JSW and JSW at fixed locations were compared to cartilage morphometry measures derived from MRI. The results were stratified by Kellgren and Lawrence (KL) grade and by tibio-femoral anatomical angle. In order to examine the relative responsiveness of various techniques, we calculated the standardized response mean (SRM) between the two visits. They concluded that their study demonstrated that new measures using a software analysis of digital knee radiographic images are comparable to MRI in detecting OA progression, and potentially superior when considering the cost effectiveness of the two imaging modalities.[11]Sowers M et alestimated the prevalence of knee features defined on magnetic resonance imaging in a population and to relate these abnormalities to knee osteoarthritis severity scores based on radiographic findings, physical functioning, and reported knee pain in middle-aged women. Magnetic resonance images of the knee were evaluated for the location and severity of cartilage defects, bone marrow lesions, osteophytes, subchondral cysts, meniscal and/or ligamentous tears, effusion, and synovitis among 363 middle-aged women (724 knees) from the Michigan Study of Women's Health Across the Nation. These findings were related to Kellgren-Lawrence osteoarthritis severity scores from radiographs, self-reported knee pain, self-reported knee injury, perception of physical functioning, and physical performance measures to assess mobility. Radiographs, physical performance assessment, and interviews were undertaken at the 1996 study baseline and again (with the addition of magnetic resonance imaging assessment) at the follow-up visit during 2007 to 2008. The prevalence of moderate-to-severe knee osteoarthritis changed from 3.7% at the baseline assessment to 26.7% at the follow-up visit eleven years later. Full-thickness cartilage defects of the medial, lateral, and patellofemoral compartments were present in 14.5% (105 knees), 4.6% (thirty-three knees), and 26.2% (190 knees), respectively. Synovitis was identified in 24.7% (179) of the knees, and joint effusions were observed in 70% (507 knees); 21.7% (157) of the knees had complex or macerated meniscal tears. Large osteophytes, marked synovitis, macerated meniscal tears, and full-thickness tibial cartilage defects were associated with increased odds of knee pain and with 30% to 40% slower walking and stair-climbing times. They concluded that middle-aged women have a high prevalence of moderate-to-severe knee osteoarthritis corroborated by strong associations with cartilage defects, complex and macerated meniscal tears, osteophytes and synovitis, knee pain, and lower mobility levels.[12]

CONCLUSION

MRI plays an important role in imaging the bony and soft tissues of knee as a whole organ, thereby helping in better management and outcome of the disease. Also MRI plays an important role in depicting early changes of osteoarthritis.

BIBLIOGRAPHY

1. Hayashi D, Roemer FW, Guermazi A. Imaging for osteoarthritis. Annals of Physical and Rehabilitation Medicine. 2016; 59(3): 161- 169.
2. Hayashi D, Guermazi A, Kwoh CK, Hannon MJ, Moore C, Jakicic JM, et al. Semiquantitative assessment of subchondral bone marrow edema-like lesions and subchondral cysts of the knee at 3 T MRI: A comparison between intermediate-weighted fat-suppressed spin echo and Dual Echo Steady State sequences. BMC MusculoskeletDisord2011;12:198.
3. Hayashi D, Englund M, Roemer FW, Niu J, Sharma L, Felson DT, et al. Knee malalignment is associated with an increased risk for incident and enlarging bone marrow lesions in the more loaded compartments: the MOST study. Osteoarthritis Cartilage 2012;20:1227–33.
4. Roemer FW, Guermazi A, Niu J, Zhang Y, Mohr A, Felson DT. Prevalence of magnetic resonance imaging-defined atrophic and hypertrophic phenotypes of knee osteoarthritis in a population-based cohort. Arthritis Rheum 2012;64:429–37.
5. Soudry M, Lanir A, Angel D, Roffman D, Kaplan N, Mendes DG. Anatomy of the normal knee as seen by magnetic resonance imaging. The journal of bone and joint surgery. 1986; 68(1): 117- 120.
6. Kellgren JH, Lawrence JS. Radiological assessment of osteo-arthrosis. Ann Rheum Dis 1957;16:494–502
7. Guermazi A, Hunter DJ, Li L, Benichou O, Eckstein F, Kwoh CK, et al. Different thresholds for detecting osteophytes and joint space narrowing exist between the site investigators and the centralized reader in a multicenter knee osteoarthritis study – data from the Osteoarthritis Initiative. Skeletal Radiol2012;41:179–86.
8. Duryea J, Neumann G, Niu J, Totterman S, Tamez J, Dabrowski C, et al. Comparison of radiographic joint

space width with magnetic resonance imaging cartilage morphometry: analysis of longitudinal data from the Osteoarthritis Initiative. Arthritis Care Res (Hoboken) 2010;62:932–7.
9. Menashe L1, Hirko K, Losina E, Kloppenburg M, Zhang W, Li L, Hunter DJ. The diagnostic performance of MRI in osteoarthritis: a systematic review and meta-analysis. Osteoarthritis Cartilage. 2012 Jan;20(1):13-21.
10. Guermazi A, Hayashi D, Roemer F, Felson DT, Wang K, Lynch J et al. Severe radiographic knee osteoarthritis – does Kellgren and Lawrence grade 4 represent end stage disease? Osteoarthritis Cartilage. 2015; 23:1499-1505.
11. Duryea J, Neumann G, Niu J, Totterman S, Tamez J, Dabrowski C et al. Comparison of radiographic joint space width with magnetic resonance imaging cartilage morphometry: analysis of longitudinal data from the Osteoarthritis Initiative. Arthritis care & research. 2010;62(7):932-7.
12. Sowers M, Karvonen-Gutierrez CA, Jacobson JA, Jiang Y, Yosef M. Associations of anatomical measures from MRI with radiographically defined knee osteoarthritis score, pain, and physical functioning. J Bone Joint Surg Am. 2011 Feb 2;93(3):241-51.