

Original Research

MRI findings of subjects having Knee Osteoarthritis

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ABSTRACT:

Background: This study was conducted to assess the MRI findings in subjects having Knee Osteoarthritis. **Material and methods:** Present study was conducted on 25 patients with presenting with knee pain and clinical suspicion of osteoarthritis. The patients were subjected to comprehensive radiographic and MR imaging evaluations. Informed consent was obtained from all the subjects/guardians before the study. The detailed clinical history regarding the onset of symptoms was also obtained. The spectrum of findings was recorded as per the proforma. Patients with past history of trauma or knee surgery were excluded from the study. Anteroposterior radiographs of the knee were obtained in a weight-bearing extended position by using a standard radiographic technique. All radiographs were assigned scores by using the Kellgren-Lawrence scoring system. **Results:** There were 10 males and 15 females in the study. 76% of the subjects were above 50 years of age. **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.

Keywords: MRI, knee, osteoarthritis

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INTRODUCTION

Osteoarthritis (OA) is a widely prevalent disease worldwide and, with an increasing ageing society, is a challenge for the field of physical and rehabilitation medicine. Osteoarthritis (OA) is a disease of the synovial joint tissues in which there is destruction of synovial joint tissues and active, but ineffective attempts at repair. This structural change can lead to pain and disability. In fact, the risk for disability caused by OA is on par with that of cardiovascular disease and greater than that due to any other medical condition in the elderly. Despite this, the etiology and pathology of OA are not well understood. This contributes to the discrepancy between pathological evidence for the disease and clinical symptoms. Because of this inconsistency, no single measure is used for diagnosis in OA, but rather a combination of tools, which yields better diagnostic performance than does any one of those tools on its own.¹

Currently, the diagnosis of knee OA in the clinic is most often made using the 1986 criteria of the

American College of Rheumatology. These criteria include a combination of the patient's age, signs and symptoms on physical exam, radiographic and/or laboratory evidence. When the radiograph is used along with physical exam, the sensitivity and specificity of this method are 91% and 86%, respectively. Using a classification and regression tree technique (CART) with clinical, radiographic and laboratory evidence raises the sensitivity and specificity into the mid-eighty to mid-ninety percent range. These diagnostic techniques are relatively inexpensive and readily available. More recently, the European League against Rheumatism (EULAR) OA Task Force suggested that a confident clinical diagnosis of knee OA may be made according to 3 symptoms (persistent knee pain, morning stiffness and reduced function) and 3 signs (crepitus, restricted movement and bony enlargement). Although the ACR or EULAR criteria remain the standard for diagnosis both in the clinic and in research, magnetic resonance imaging (MRI) has been increasingly used as well.²

Radiography is the simplest, least expensive and most commonly deployed imaging modality for OA. It enables detection of OA-associated bony features such as osteophytes, subchondral sclerosis and cysts. Radiography can also determine joint space width (JSW), which is a surrogate for cartilage thickness and meniscal integrity in knees, but direct visualization of these articular structures is not possible. OA is radiographically defined by the presence of marginal osteophytes. Worsening of JSN is the most commonly used criterion for the assessment of structural OA progression and the total loss of JSW (“bone-on-bone” appearance) is one of the indicators for joint replacement.³

Hence, this study was conducted to assess the MRI findings in subjects having Knee Osteoarthritis.

MATERIAL AND METHODS

Present study was conducted on 25 patients with presenting with knee pain and clinical suspicion of

osteoarthritis. The patients were subjected to comprehensive radiographic and MR imaging evaluations. Informed consent was obtained from all the subjects/guardians before the study. The detailed clinical history regarding the onset of symptoms was also obtained. The spectrum of findings was recorded as per the proforma. Patients with past history of trauma or knee surgery were excluded from the study. Anteroposterior radiographs of the knee were obtained in a weight-bearing extended position by using a standard radiographic technique. All radiographs were assigned scores by using the Kellgren-Lawrence scoring system. This summary Kellgren-Lawrence score was based on osteophyte formation, joint space narrowing, sclerosis, and joint deformity characteristics according to the five-level scale defined as follows: grade 0, normal; grade 1, doubtful osteoarthritis; grade 2, minimal osteoarthritis; grade 3, moderate osteoarthritis; or grade 4, severe osteoarthritis.

RESULTS

Table 1: Age-wise distribution of patients

Age group (years)	Number of patients	Percentage of patients
Less than 40	02	08
40 to 50	04	16
51 to 60	07	28
61 to 70	06	24
More than 70	06	24
Total	25	100
Mean	55.36	

76% of the subjects were above 50 years of age.

Table 2: Gender-wise distribution of patients

Gender	Number of patients	Percentage of patients
Male	10	40
Females	15	60
Total	25	100

There were 10 males and 15 females in the study.

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	13	52
Grade 1	Doubtful Osteoarthritis	4	16
Grade 2	Minimal Osteoarthritis	7	28
Grade 3	Moderate Osteoarthritis	1	4
Grade 4	Severe Osteoarthritis	0	0
Total		25	100

DISCUSSION

The present study included 25 patients who had history of knee pain and clinical suspicion of Osteoarthritis of knee joint and underwent X-ray and MRI of the Knee Joint. Antero-posterior radiographs of the knee were obtained in a weight-bearing extended position by using a standard radiographic technique. All the scans were done using Siemens 1.5 Tesla High Gradient MRI scanner and using a scan

protocol which included PD fat suppressed Axial, sagittal and coronal view, T1WI sagittal view, T2WI sagittal view, T2WI space sagittal view.

The study population consisted of patients of which 76 percent belonged to the age group of more than 25 years. Mean age of the patients was 55.36 years. 60 percent of the patients were females while 40 percent of the patients were males. Our results were in concordance with the results obtained by previous

authors who also reported similar findings. Singh AK et al reported that 56.25 percent of OA patients in their study were of more than 50 years of age.⁴

As reported in the past literature, about 13% of women and 10% of men aged 60 years and older have symptomatic knee OA. The proportions of people affected with symptomatic knee OA is likely to increase due to the aging of the population and the rate of obesity or overweight in the general population. A female predilection for occurrence of OA has also been reported in the past literature by Pal CP et al and Singh AK et al.^{4,5}

The increase in the prevalence and incidence of OA with age probably is a consequence of cumulative exposure to various risk factors and biologic changes that occur with aging that may make a joint less able to cope with adversity, such as cartilage thinning, weak muscle strength, poor proprioception, and oxidative damage. Women not only are more likely to have OA than men, they also have more severe OA. The definite increase in OA in women around the time of menopause has led investigations hypothesize that hormonal factors may play a role in the development of OA.^{6,7}

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.

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