



THE STUDY OF CLINICAL AND RADIOLOGICAL FEATURES OF OSTEOARTHRITIS KNEE.

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ABSTRACT

INTRODUCTION: Osteoarthritis is a chronic disorder of synovial joint resulting from impaired balance between cartilage degeneration and regeneration. The major clinical symptom in osteoarthritis of the knee is Pain and is also the main reason for seeking medical care. Pain is slowly progressive in nature. Approximately, 45% of women over the age of 65 years have symptoms while 70% of those over 65 years show radiological evidence.

OBJECTIVE: The present study was conducted to determine the clinical and radiological features of OA knee.

METHODS: This Study was conducted in Department of Orthopaedics, NSCB MCH, Jabalpur (M.P.) from March 2015 to September 2016. After informed consent, standing X-ray (AP and lateral) was taken. Joint space narrowing and osteophyte count were used to elaborate radiological findings. For the assessment of clinical features VAS score and functional WOMAC score were used.

RESULT: in our study the mean age of presentation for osteoarthritis was 56.17 ± 9.776 years. 38.60% knees had synovial thickening and 55.1% knees had joint effusion. Only 3.8% knees could climb stairs without any problem and 19.4% knees had normal squatting. Our study found significant correlation between functional Pain & joint space narrowing. (P = 0.0001 < 0.05 so, it is statistically significant).

KEYWORDS : OA, WOMAC, VAS,

INTRODUCTION

Osteoarthritis is a chronic disorder of synovial joint resulting from impaired balance between cartilage degeneration and regeneration. There occurs progressive softening and disintegration of articular cartilage along with growth of new cartilage and bone at joint margins. Sclerosis of subchondral bone, mild synovitis, capsular fibrosis and cyst formation are also the features of OA¹. It is more common in women than men and the prevalence increases dramatically with age². Approximately, 45% of women over the age of 65 years have symptoms while 70% of those over 65 years show radiological evidence.²

The major clinical symptom in osteoarthritis of the knee is Pain and is also the main reason for seeking medical care. Pain is slowly progressive in nature. Pain related to osteoarthritis of the knee contributes to functional limitations and reduced quality of life and also cause impairment of mobility in elderly population.³ Despite the importance of pain in knee osteoarthritis, its cause is not well understood yet.

OA can be diagnosed with the help of weight bearing standard radiograph in two planes (antero-posterior and lateral view) . Diagnosis can also be strengthened by arthroscopy which shows cartilaginous damage even before x-ray.⁴ OA is a complex disease involving whole joint It is therefore must to assess all intra articular structures to further understand pathogenesis and progression of disease.

Ideally, one imaging modality is sufficient for sensitive and specific depiction of all components of the joint. However, in some tissues, additional supplemental imaging modalities may be needed to improve depiction, especially in the synovium and in the absence of full thickness articular cartilage defects.⁵

Stages of OA

five stages

Stage 0 - Classified as normal knee .there is no osteophytes and joint space narrowing.

Stage 1 - Very minor bone spur growth usually patient is asymptomatic at this stage.

Stage 2 - Mild OA. X-rays reveal greater bone growth cartilage.

Patients start experiencing symptoms - usually on and off type.

Stage 3 - Moderate OA. Cartilage and bone shows damage Joint space starts narrowing.

Patients frequently experiences pain, Joint swelling may be seen.

Stage 4 - Severe OA Cartilage is almost completely eroded.

Joint space dramatically reduced. Joint is stiff and almost immobile. X-rays shows bone on bone appearance. Patient will have severe pain even at rest.

Classification

There are two types of osteoarthritis of knee joint^{6,7}.

1. Primary osteoarthritis
2. Secondary osteoarthritis.

Primary: When the cause is not known.. It is seen commonly in elderly patients having no any previous pathology. It is mainly due to wear and tear changes occurring in old age mainly in weight bearing joints. It is more common than secondary osteoarthritis

Secondary: When the cause is known. The causes may be injury to joint, previous infection, pre-existing deformity (mostly varus deformity of knee), obesity, hyperthyroidism, osteoporosis and joint dysplasia. Miners, people whose work require regular knee bending and lifting or carrying heavy loads have high rates of osteoarthritis knee. Therefore the present study was conducted in NSCB MCH Jabalpur to determine the clinical and radiological features of OA knee.

MATERIAL AND METHODS

This Study was conducted in Department of Orthopaedics NSCB MCH, Jabalpur (M.P.) from March 2015 to September 2016. The study was conducted to assess clinical and radiological features of OA knee on 300 subjects (396 knees).

Inclusion criteria:

- Patients with Chronic knee pain (>3 months)
- Age between 40– 80 years
- Nontraumatic knee pain
- Non - radicular knee pain
- Deformity (Varus & Valgus deformity <100).

Exclusion criteria:

- Osteoarthritis with recent trauma of knee or surgery.
- Patient with ligament injury of knee less than 3months.
- Unwilling patient.
- Non ambulatory patient.
- Any chronic medical condition other than osteoarthritis known to be associated with disability (eg. inflammatory rheumatic diseases, symptomatic cardiac and pulmonary disease, diagnose mental illness etc.)

After informed consent, standing X-ray(AP and lateral) was taken, which was the main tool for assessment of radiological findings. KL score, joint space narrowing and osteophyte count were used to elaborate radiological findings. For the assessment of clinical features VAS score and functional WOMAC score were used. In our study we observed that when Q angle decreases there is increasing severity of radiological features.

TABLE NO. - 1: DISTRIBUTION OF CASES ACCORDING TO AGE

Age (in years)	No. of cases	Percent
40-49	70	23.33%
50-59	100	33.33%
60-69	101	33.67%
>70	29	9.67%
Total	300	100%

TABLE NO. - 2: DISTRIBUTION OF KNEES ACCORDING TO SYNOVIAL THICKENING

Synovial Thickening	No. of knees	Percent
Present	153	38.60%
Absent	243	61.40%
Total	396	100.0

TABLE NO. - 3: DISTRIBUTION OF KNEES ACCORDING TO JOINT EFFUSION

Joint effusion	No. of Knees	Percent
0	178	44.90%
Trace	179	45.20%
+1	31	7.80%
+2	2	0.50%
+3	6	1.50%
Total	396	100.0

TABLE NO. - 4: DISTRIBUTION OF KNEES ACCORDING TO PAIN ON STAIR CLIMBING

Grade	No. of Knees	Percent
0 (No climbing)	43	10.90%
1 (Climbing in any way)	110	27.80%
2 (Climbing with person support)	146	36.90%
3 (Climbing with railing support)	82	20.70%
4 (Climbing without difficulty)	15	3.80%
Total	396	100.0%

TABLE NO. - 5: DISTRIBUTION OF KNEES ACCORDING TO SQUATTING

Squatting	No. of Knees	Percent
0 (No squatting)	27	6.8%
1 (Squatting when supported by any person)	7	1.8%
2 (Squatting with any support)	91	23.0%
3 (Squatting with slight difficulty)	194	49.0%
4 (Normal squatting)	77	19.4%
Total	396	100.0%

TABLE NO. - 6: DISTRIBUTION OF KNEES ACCORDING TO Q ANGLE

Q-Angle	No. of Knees	Percent %
0°-5°	5	1.3%
6° -10°	218	55.1%
11° -15°	173	43.7%
Total	396	100.0%

RESULT

In our study 300 patients were observed in which the mean age of presentation for osteoarthritis was 56.17 ± 9.776 years. Maximum patients belonged to belongs to 60-69 years (33.67%).(table1). 38.60% knees had synovial thickening and in 61.4% knees, there was no synovial thickening.(table2). 44.9% knees had no joint effusion, 45.2% knees had small amount of joint effusion, 7.8% knees had effusion which was not seen after applying upward pressure over medial side of knee joint, 0.5% knees had effusion ,which was reversible after applying upward pressure over medial side of knee joint and 1.5% knees had effusion which is not reversible in any way.(table 3)

In the present study 10.9% knees could not perform stair Climbing, 27.8% knees climbing stairs in any way, 36.90% knees climbing stairs by any person support, 20.7% knees shows climbing stair by railing support, 3.8% knees climbing stairs without any problem.(table 4). 6.8% knees could not do squatting, 1.8% knees showed severe difficulty in squatting which was possible only when supported by any other person, 23% knees had moderate difficulty in squatting which is possible by support of anything , 49% knees showed slight difficulty in squatting and 19.4% knees had normal squatting.(table 5)

In our study, 1.3% knees had Q-angle between 0°-5°, 55.1% knees had Q-angle 6°-10° and 43.7% knees had Q-angle 11°-15°(table 6). Our study found significant correlation between functional WOMAC score & No. of osteophytes. (P = 0.0001 < 0.05 so, it is statistically significant)(table 7) In our study there is significant correlation between functional Pain & joint space narrowing. (P = 0.0001 < 0.05 so, it is statistically significant)(table 8).

DISCUSSION

In our study, we have analyzed 300 cases (396 knees) of chronic knee pain (greater than 3 months) with non-traumatic and non-radiating etiology in age group of 40 to 80 years. In our study 23.33 % cases belongs to age group 40-49 years, 33.33% belongs to 50-59 years, 33.67% belongs to 60-69 years and rest 9.67% belongs to age >70 years. The mean age of presentation for osteoarthritis is 56.17 ± 9.776 years. This can be compared with the study of Lan T et al⁸ (2014) in which they have analyzed 170 men and 488 women of age > 40 years of osteoarthritis knee and reported that 8% belonged to 40-49 years, 30% in 50-59 years, and 61.1% belonged to age group > 60 years. Mean age of presentation for osteoarthritis knee was 55.9±12.6 years. In another study by Cubukcu et al⁹ (2012) the mean age of presentation in osteoarthritis knee was 56.98±8.28 years.

In our study 38.60% knees had synovial thickening and in 61.4% knees, there was no synovial thickening which is comparable with the study of Scanzello et al¹⁰ (2012) in which they reported that synovial thickening was present in 50% cases of osteoarthritis knee.. Our study showed that 55.1% patients had effusion of knee out of which only 1.5% knees had irreversible effusion . This can be compared with results of Peter R et al¹¹ where the incidence of effusion in knee in cases of OA was 55%.

In our study out of 300 patients only 3.80% patients could climb without difficulty. Sandmark et al(2000), coggon et al (2000), lau et al (2002) shows strong correlation between stair climbing and OA knee. 6.8% knees could not do squatting, 1.8% knees showed severe difficulty in squatting which was possible only when supported by any other person, 23% knees had moderate difficulty in squatting which is possible by support of anything , 49% knees showed slight difficulty in squatting and 19.4% knees had normal squatting. Lin et al¹²(2010) have found that occasional squatting actually decreased the risk of knee osteoarthritis development.

Present study showed significant correlation between VAS, Pain & joint space narrowing. (ANOVA test was applied and p = 0.0001 which is < 0.05 so, it is statistically significant). In a similar study by Cicuttini et al (1996)¹³ they found that there is significant association between knee pain and increasing grade of narrowing in joint space (p < 0.001). This study is comparable with our study in which p < 0.05.

In our study Q angle of >10 degree was found in 43.7% of cases. This result can be compared with the study of Ayse Aydemir Aekim et al¹⁴ where high Q angle was seen in 41.17% cases.

CONCLUSION

In the present study of clinical and radiological features of OA the mean age of presentation for osteoarthritis was 56.17 ± 9.776 years. Maximum patients belonged to belongs to 60-69 years . the main clinical features were pain, synovial thickening and joint effusion. Patients experienced difficulty in climbing stairs and squatting. The main radiological feature seen were joint space narrowing and osteophytes.

REFERANCES.

1. Spector TD, Halt DJ, Byone J. Definition of osteoarthritis of knee for epidemiological studies. *J Ann Rheum Dis.* 1993;52:790-794.
2. Silman AJ, Hochberg MC. *Epidemiology of the Rheumatic Diseases.* 2nd ed. Oxford: Oxford University Press. 2001.
3. Guccione AA, Felson DT, Anderson JJ, Anthony JM, Zhang Y, Wilson PW, et al. The effects of specific medical conditions on the functional limitations of elders in the Framingham study. *Am J Public Health* 1994;84:351-8.
4. Bhandarkar P. Prevalence of osteoarthritis knee: four year study based on digital records of comprehensive healthcare setup at Mumbai, India *nt J Community Med Public Health.* 2016;3(5):1049-1053
5. Braun HJ, Gold GE. Diagnosis of osteoarthritis: imaging bone. *2012;51(2):278-88.*
6. Das SK, Ramakrishnan S. Osteoarthritis; *Manual of Rheumatology*(1st edn) Indian Rheumatism Association: Mumbai, 1999, 335-54.
7. Moskowitz RW. Osteoarthritis symptoms and signs. *Osteoarthritis diagnosis and management*, 5th Edition. WB Saunder. 1993, 255-261.
8. Lan T. et al . Prevalence of Radiographic Osteoarthritis of the Knee and Its Relationship to Self-Reported Pain. *plos one* April 10, 2014 9(4)
9. Duygu Cubukcu, Ayse Sarsan, Hakan Alkan. Relationships between Pain, Function and Radiographic Findings in Osteoarthritis of the Knee: A Cross-Sectional Study. 24 October 2012. Volume 2012, Article ID 984060, 5 pages.
10. Scanzello CR, Goldring SR. The role of synovitis in osteoarthritis pathogenesis. *Bone.* 2012;51:249–257. doi: 10.1016/j.bone.2012.02.012
11. Peter R et al. osteoarthritis of knee: association between clinical features and MR imaging findings. *Radiology* volume 239; number 3-june 2006.
12. Lin j et al. risk factors for radio graphic tibiofemoral knee osteoarthritis: the wuchuan osteoarthritis study. *Int J Rheumatol.* 2010;2010:385826.
13. Cicuttini FM, Baker J, Hart DJ, Spector TD. Association of pain with radiological changes in different compartments and views of the knee joint. *Osteoarthritis Cartilage.* 1996;4:143–14
14. Ayse Aydemir Aekim et al. relationship between q angle and articular cartilage in female patients with symptomatic knee OA: ultrasonographic and radiologic evaluation. *Arch rheumatol* 2017;32(4):347-352