

A STUDY ON OSTEOARTHRITIS OF KNEE JOINT

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ABSTRACT

BACKGROUND

Osteoarthritis is the most common type of arthritis. It is a degenerative disease where, load bearing synovial joints like hip and knee are affected. Usually bilateral, highest incidence is seen after 6th decade of life. It is also common in women post-menopausal age. Osteoarthritis of knee is more common in Asian population because of lifestyle habits like squatting and sitting cross legged. The aetiology of the disease can be multifactorial but usually it is an age associated disease due to wear and tear.

The two types of osteoarthritis are, Primary osteoarthritis: It is more common. This occurs in old age due to wear and tear of the joints and Secondary osteoarthritis: In this there is an underlying primary joint disease which leads to degeneration. Any age group can be affected. Predisposing factors are, congenital malformation of joint, trauma, disease involving joints, malalignment, internal derangement and obesity.

A sincere effort has been put in this study to understand the Osteoarthritis complications in the elderly population. This study is intended to help the practicing fellow orthopaedicians to understand and thus treat the patient more effectively.

METHODS

- The study was done in the Department of Orthopaedics, Travancore Medical College at Kollam.
- The study was done from June 2014 to June 2016.
- Three Hundred Twenty cases who attended in the Department of Orthopaedics were taken for the study.
- Detailed History and Clinical Examination was conducted.
- All the statistical analysis was done using the latest SPSS software 2015 (California).

RESULTS

In the present study, the mean age of the population was 62.67 years with a standard deviation of 11.739 years. Crepitus was present in eighty three cases; pain was the chief complaint and was present in two hundred and thirty eight cases. Stiffness was complained in two hundred and fourteen cases and in seventy one cases the patient complained of swelling. On Clinical Examination the symptoms that was found highest in frequency was tenderness in one ninety six cases, Limitation of joint movements in one hundred seventy three cases, crepitus in twenty five cases and gross deformation in fifteen cases.

The association of investigations showed strong significance with the positivity. Subchondral sclerosis was present in forty eight cases, narrowing of joint space on X-ray was seen in two hundred and seventeen cases, osteophyte formation/subchondral cyst was observed in twenty five cases. Deformation of joint and loose bodies was observed in twelve cases. On treatment osteotomy was successful in forty nine cases, medical line of treatment was successful or at least stopped the progression of the disease in two hundred two cases. Arthroscopic procedure was successful in twenty cases and joint replacement in eleven cases.

CONCLUSION

The study successfully evaluates the different signs and symptoms that are commonly involved in osteoarthritis. In the present study we also were successful in showing the association of different investigations and modes of treatment in successfully treating the cases of osteoarthritis.

KEYWORDS

Osteoarthritis, Knee Joint, Elderly, Bicondylar, Femur, Tibia.

HOW TO CITE THIS ARTICLE: Nair A, Cherayan AG, Vinod VS, et al. A study on osteoarthritis of knee joint. J. Evid. Based Med. Healthc. 2016; 3(78), 4215-4218. DOI: 10.18410/jebmh/2016/898

Financial or Other, Competing Interest: None.
Submission 29-08-2016, Peer Review 12-09-2016,
Acceptance 20-09-2016, Published 27-09-2016.
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 DOI: 10.18410/jebmh/2016/898



INTRODUCTION: About 100 million people are suffering from osteoarthritis globally.^[1,2] Osteoarthritis can be defined as progressive joint, which characteristically involves often the joints of the extremities. The disease is characterised by joint inflammation and when the destruction is taking place concurrently reparative bone response will be progressive. Osteoarthritis is one known to cause disabilities in about more than one third of the total population who are aged more than fifty years. In United States of America around

thirty million cases have been confirmed to have Osteoarthritis. About 100 million people are suffering from osteoarthritis globally. The financial expenditures for the care of persons with Osteoarthritis are estimated to be very high per year. In a developing country like ours where the Health system is already overburdened this disease causes a menace. As the number of people who age increases, so does the prevalence of Osteoarthritis. And the need for cost-effective treatment and care is the need of the hour. Developing an effective way of managing these patients include conclusive and definitive treatment strategies. Especially in a developing country like ours where the old aged people are increasing day by day it is necessary to device plans and also have the statistics of the successful and the failure rates of different treatment plans.

Knee is a complex hinge type of bicondylar joint between femur and tibia. It allows some rotation and glide between the joint surface. The patella articulates over the front of condyles of femur. Although the femoral condyles are convex, the presenting surface towards tibia is almost flat. The menisci help in spreading the load on the joint and also act as spacers. The knee joint is stabilised by its ligaments. The anterior and posterior cruciate ligaments form a four bar cross linkage between femur and tibia, which stabilises the joint and prevents excessive forward and backward glide and creates complex movements like rolling and gliding. The anterior translation of tibia on femur is prevented by anterior cruciate ligament. Posterior translation of tibia on femur is prevented by posterior cruciate ligament. The medial collateral ligament prevents the medial opening up of the joint. The lateral collateral ligament prevents the lateral opening up of the joint.^[3]

Osteoarthritis is the most common type of arthritis. It is a degenerative disease where, load bearing synovial joints like hip and knee are affected. Usually bilateral, highest incidence is seen after 6th decade of life. It is also common in women post-menopausal age. Osteoarthritis of knee is more common in Asian population because of lifestyle habits like squatting and sitting cross legged. The aetiology of the disease can be multifactorial but usually it is an age associated disease due to wear and tear.

The two types of Osteoarthritis are,

- **Primary osteoarthritis:** It is more common. Occurs in old age due to wear and tear.
- **Secondary Osteoarthritis:** In this there is an underlying primary joint disease which leads to degeneration. Any age group can be affected. Predisposing factors are, congenital malformation of joint, trauma, disease involving joints, malalignment, internal derangement and obesity.

Osteoarthritis is characterised by episodes of inflammation which leads to stiff and tender joints. Osteophyte develops around the joint margins leading to reduction of range of movement around the joint. The disease affects both bone and cartilage. Initial changes seen are disruption of surface collagen because of depletion of proteoglycans in collagen. There is increase in water content

and softening of cartilage. There is fibrillation of the cartilage due to repeated weight bearing. The gradual loss of articular cartilage due to grinding of articular surface leads to joint space narrowing. There is osteoblast proliferation in subchondral bone leading to formation of marginal osteophytes. Microfractures develop in subarticular bone. The underlying bone gets exposed and with further rubbing, and it has a polished appearance also known as eburnation. There can be formations of subchondral cysts and sclerosis. The loose cartilage flakes can cause thickening of capsule and synovial inflammation.

In knee joint, medial compartment is affected more which leads to genu varus deformity.

The patient usually presents with pain. Pain is intermittent in the beginning and may become constant as time passes. Initially it is dull pain which may become cramp like. Coarse crepitus can be a presenting complaint along with pain. The patient may also present with swelling and stiffness of joint.

On examination, there is tenderness along the joint line, crepitus on moving the joint; joint is enlarged and irregular looking, varus deformity of knee, effusion, limitation of joint movements, subluxation, wasting of quadriceps femoris.

X-ray examination of knee may show, narrowing of joint space, subchondral sclerosis, osteophyte formation, subchondral cyst, deformation of joint and loose bodies.

Arthroscopy can be performed if there is suspicion of a loose body or frayed meniscus.

Rheumatoid arthritis can be ruled out by serological tests and ESR. Serum uric acid can be estimated to rule out gout.

Once the disease process begins it doesn't stop. The principles of treatment are, to delay the onset, stop the progress and to rehabilitate the patient.

Long acting formulations of analgesics can be given to suppress the pain. In some early cases, chondroprotective agents like chondroitin sulphate and glucosamine can be tried. Visco supplements like sodium hyaluron can be injected locally. Intra articular corticosteroid may be helpful in some cases. Weight reduction, avoidance of joint stress, local heat local application of counter irritants and exercises to build up local muscle strength may also help.

Surgical approach is helpful in selected cases. The following are the types of surgeries performed;

- **Osteotomy:** High tibial osteotomy for osteoarthritis knee with genu varum is known to bring relief in symptoms.
- **Joint Debridement:** Not a popular procedure with unpredictable results. Here the joint is opened up, degenerated cartilage is smoothed, hypertrophied synovium and osteophytes are excised.
- **Arthroscopic Procedure:** The degenerated fibrillated cartilage can be excised using a power driven shaver under arthroscopic vision.
- **Joint Replacement:** It is a relatively new procedure. It is done in painful disabling arthritis. The artificial knee joint consists of a U shaped cap to the

prepared lower end of femur, tibial base plate to cover the flat upper end of tibia, Plastic tray between the metallic tibial and femoral components and a polyethylene patellar button. The prosthesis may help in excellent functions upto 10-15 years. Complications can be infections, deep vein thrombosis, peroneal nerve palsy, fractures and knee stiffness.^[4]

While Osteoarthritis is equally present in men and women, it appears to be more common among younger men (<45 years) and in the older women (>45 years).^[5-8] A sincere effort has been put in this study to understand the Osteoarthritis complications in the Elderly population. This study is intended to help the practicing fellow orthopaedicians to understand and thus treat the patient more effectively.

AIMS AND OBJECTIVES: To study the osteoarthritis of knee joint.

MATERIALS AND METHODS:

- The study was done in the Department of Orthopaedics, Travancore Medical College, at Kollam.
- The study was done from June 2014 to June 2016.
- Three Hundred Twenty cases who attended in the Department of Orthopaedics were taken for the study.
- Detailed History and Clinical Examination was conducted.

Inclusion Criteria:

1. Only confirmed cases of osteoarthritis were taken up for the study.
2. Individuals who were aged more than 50 years were taken up for the study.

Exclusion Criteria:

1. Other factors which caused osteoarthritis like rheumatoid arthritis was not considered for the study.
2. Aged less than 50 years were not considered.
3. Sex related statistical analysis could not be done as the number of female patients was less in number compared to the male counterpart.

All the statistical analysis was done using the latest SPSS software 2015. (California).

RESULTS:

	Mean	Std. Deviation
Age	62.67	11.739

Table 1: Mean age of the study participants (n=320)

Signs	
Crepitus	83
Pain	238
Stiffness	214
Swelling	71
Symptoms	
Crepitus	25
Tenderness	196
Limitation of Joint Movements	173
Gross Deformation	15

Table 2: Frequency of Different Signs and Symptoms

Investigations for particular pathology	Present (%)	Absent (%)	p value
Subchondral sclerosis	48(15.8)	8(50.0)	0.005
Narrowing of joint space on X –Ray	217(71.4)	6(37.5)	
Osteophyte formation/ subchondral cyst	27(8.9)	1(6.2)	
Deformation of joint and loose bodies	12(3.9)	1(6.2)	
Treatment	Successful	Un successful	p value
Osteotomy	49(17.4)	7(18.4)	0.030
Medical Line of Treatment	202(71.6)	21(55.3)	
Arthroscopic procedure	20(7.1)	8(21.1)	
Joint replacement	11(3.9)	2(5.3)	

Table 3: Association of Investigations and Treatment

Obesity	Present	Absent	X ² value	p value
	147	173	8.113	0.044

Table 4: Association with obesity

DISCUSSION: In the present study the mean age of the population was 62.67 years with a standard deviation of 11.739 years. Crepitus was present in eighty three cases; pain was the chief complaint and was present in two hundred and thirty eight cases. Stiffness was complained in two hundred and fourteen cases and in seventy one cases the patient complained of swelling. On Clinical Examination the symptoms that was found highest in frequency was tenderness in one ninety six cases, Limitation of joint movements in one hundred seventy three cases, crepitus in twenty five cases and gross deformation in fifteen cases. Many cases were having multiple signs and symptoms and thus to come to a definitive conclusion of particular signs and symptoms was rather a tough task. The signs and symptoms were vague and the only thing that points to the disease was the age.

The association of investigations showed strong significance with the positivity. Subchondral sclerosis was present in forty eight cases, narrowing of joint space on X – ray was seen in two hundred and seventeen cases, osteophyte formation/ subchondral cyst was observed in twenty five cases. Deformation of joint and loose bodies was observed in twelve cases. On treatment osteotomy was successful in forty nine cases, medical line of treatment was successful or atleast stopped the progression of the disease in two hundred two cases. Arthroscopic procedure was successful in twenty cases and joint replacement in eleven cases. The present study is in agreement with the other studies conducted.^[1,2,5,6,7] The study is not in agreement with the other studies.^[8] This might be because of the fact that the age group considered for our study was not matching with that of the other study. Even the geographical consideration and the anthropological background of the study conducted were different.

There was strong association of presence of osteoarthritis with obesity. Generally the patients who came to the OPD and were diagnosed to have osteo – arthritis were obese. The age of developing the disease also was low when compared to the non-obese counterpart.

CONCLUSION: The study successfully evaluates the different signs and symptoms that are commonly involved in osteoarthritis. In the present study we also were successful in showing the association of different investigations and modes of treatment in successfully treating the cases of osteoarthritis.

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