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# A BRIEF STUDY ABOUT OSTEOARTHRITIS : REVIEW ARTICLE

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## ABSTRACT

People at the age of 65 or above experience risk of mobility and disability (need help in climbing stairs or normal walking) with pain in knee, hand or hip region, the most common cause of this condition is osteoarthritis. Osteoarthritis is admitted to be the major health problem that affects the quality of life mainly in old age. Osteoarthritis is a chronic arthropathy affecting the entire joint, involving the joint lining, ligaments, cartilage and underlying bone. Osteoarthritis is the result of many factors that include obesity, aging, joint injury and nutritional deficiency, it's initiation at molecular level is not clearly understood. Its management focus on improving joint function and reducing pain and regular exercise are recommended to increase the mobility of joints. This review highlights the ongoing thinking on clinical features, diagnosis and investigations, pathogenesis, and management of osteoarthritis. In the conclusion we get to know about the complete management (non-pharmacological and pharmacological treatments) in different age group.

**KEYWORDS:** Arthropathy, Osteoarthritis, Pharmacological, Pathogenesis, Management.

## INTRODUCTION

Osteoarthritis is the most common global chronic degenerative disorder that results in structural and functional failure of synovial joint and permanent loss of articular cartilage. It is the second most common rheumatologic problem with a prevalence of 22% to 39% in India.[1,2] Osteoarthritis is more common in women then in men's while below the age of 45 it is more common in men's.[3,4] Osteoarthritis is the clinical and pathological outcome of group of disorders; some of the pathological changes seen in osteoarthritis include progressive loss and destruction of articular cartilage, formation of osteophytes, and degeneration of ligaments and hypertrophy of joint capsule.[5,6] Decreased strength in the muscle groups involving the joints leads to walking with difficulty, poor alignment of the limb and instabilities. Crackling sound can be heard during movement because of arthritis.[7] Old aged people should be monitored regularly as they are at highest risk.

### Osteoarthritis is of 2 types

1. **Primary osteoarthritis:** Most common, generalized, primarily affects the fingers, thumbs, spine, hips, knees, and the great (big) toes.
2. **Secondary osteoarthritis:** Occurs with a pre-existing joint abnormality, including injury or trauma, such as repetitive or sports-related; inflammatory arthritis, such as rheumatoid, psoriatic, or gout; infectious arthritis; genetic joint disorders.[2]

### Clinical features

Patients mainly complain of early morning stiffness (present in some patient's) and joint pain exacerbated by exercise or normal walking, which is relieved by rest. The pain in knee is generally bilateral and the hip pain experienced is in the thighs and groin region .The source of pain is not well understood, joint tenderness and crepitus on movement may also be present along with the swelling.[5] Swelling can be due to presence of osteophytes or due to effusion that is usually due to synovial fluid accumulation. Systemic symptoms are not seen and if any (fever, weight loss) it indicate the progression of other disease.

### Diagnosis and investigations

The diagnosis of osteoarthritis include the assessment of clinical features including body weight, range of motion in the joint, the location of tenderness, muscle strength, and ligament stability and is confirmed by radiography. Radiography is cheap and provides a permanent record but is not used to measure the disease progression. In advance stages radiographs show osteophytes which had a very strong relation with the knee pain.[8] Narrowing of joint space that occur (at a very slow rate) is difficult to measure accurately and is not associated with knee pain also it is not correlated with disability score (Western Ontario and McMaster Universities Osteoarthritis index, WOMAC).[9]

**Figure: 1 Radiograph showing osteoarthritis**

**Other techniques involved in diagnosis**

Magnetic resonance imaging (is not the routine clinical assessment of osteoarthritis and mainly used to diagnose the other causes of the pain however it may be specific way for quantifying cartilage loss),[10,11,12] Computed tomography (it is used when a different view of joint is required), Ultrasounds (is good for assessing changes in cartilage), Bio-markers (used to detect osteoarthritis changes in early stage, C.reactive protein, YKL-40, hyaluronan, pyridinoline are some of the bio-markers used).[13] These markers should be used in combination as single marker can't identify osteoarthritis patients.

**Pathogenesis**

Osteoarthritis is viewed as a dynamic process that progress episodically, including both cartilage destruction and repair. These processes are due to several environmental, genetic, mechanical and biochemical stress.

Cartilage contains 70% of water and proteoglycans, glycosaminoglycans that is produced by chondrocytes, it also have type-ll collagen framework. The first osteoarthritis change occurs is the decline in superficial collagen framework and increase in water content.

In osteoarthritis the synovium is inflamed, which in-turns produce interleukins (IL-1), tumor necrosis factors (TNF-alpha), cytokines and factor which bind interleukins and tumor necrosis factors within cartilage causing more destruction.

Meanwhile the subchondral bone and calcified cartilage thickens. The loss of proteoglycans and collagen fibrillation leads to splits of the cartilage extending down to bone, this degenerated cartilage cannot regenerate itself and permanent loss of cartilage is there.

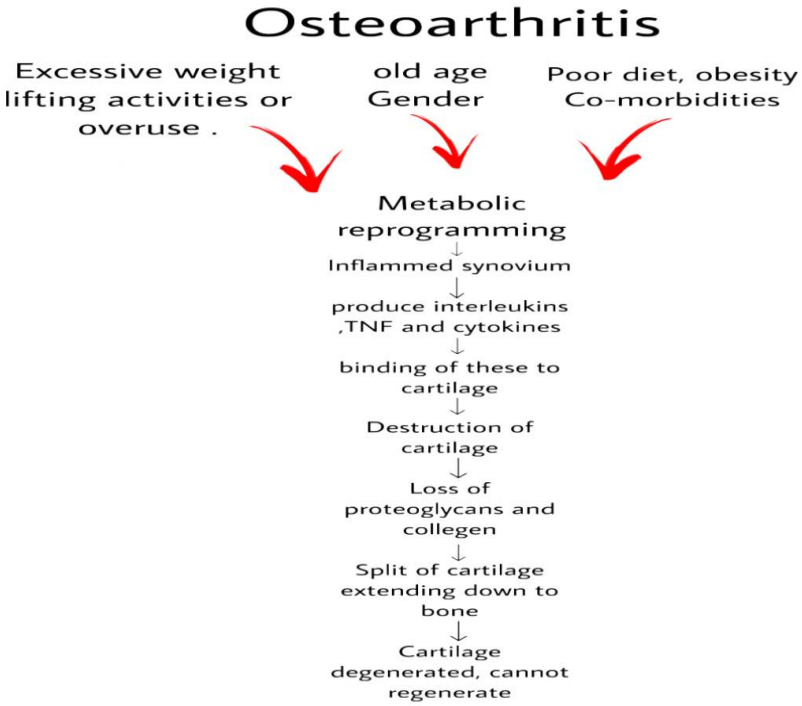


**Figure 2: Pathogenesis of osteoarthritis.**

**Management**

The current management of osteoarthritis include both pharmacological and non-pharmacological treatment.

**The Aim of Management is**

- Education of patient about the disease.
- To control the pain.
- Reduction of adverse mechanical factors.
- To alter the disease process, and to alter the consequences.

Management plan should be patient centred and is individualised. The change in conditions of patient should be monitored regularly and treatment should be modified accordingly. The recommended step-wise management of Osteoarthritis consist of non-pharmacological approach first, and then drug therapy and if these do not work surgery is the permanent solution.

**Non-pharmacology or non-drug therapy**

- **Education:-**The patient should be counselled regularly about the aspect of the disease, process, benefits and risk of treatment, and patient should be encouraged towards good lifestyle practices,[14] A team of professionals should be involved and management plans should be decided after mutually discussing with patient.
- **Exercise and dietary habits: -** It is the most important factor. Osteoarthritis leads to destabilising the joint and also reduces the aerobic capacity of muscles, exercise is needed to build muscle strength, improve the joint motion and to manage the weight, and weight loss improves pain and function of knee and hip joint.
  Weight loss can also be achieved by focusing on dietary habits (eating less at a time, avoiding fatty food) and changing the lifestyle (including wearing shock absorbing footwear, using walking aids like sticks).[14]
- **Ice and heat: -** Application of heat or cold regularly (on the knee) with the other treatment is recommended in osteoarthritis of knee.[15] It is safe and can be practised easily.
  Ice therapy cause vasoconstriction that result into decreased edema and provide analgesic effects, while heat should be applied after the initial edema phase.[16]

**Pharmacological treatment**

- **Analgesic:** Paracetamol 1g/QID is the analgesic of choice for mild to moderate pain; it is well tolerated.[17] Opiates can be added with paracetamol (however stronger opiates should be avoided).[18,19]
- **Non-steroidal anti-inflammatory drugs (NSAIDs):** NSAIDs thought to have similar pain relieving action as that of paracetamol, selective inhibitor of cyclo-oxygenase-2 (COX-2) is used frequently nowadays.[20] However there is risk for cardiovascular disease patient, patient taking aspirin and patient with gastrointestinal ulcer hence these are not used in such patient. Non-selective NSAIDs with gastroprotective agent are recommended for patient with gastrointestinal risk.
- **Intra-articular steroids:** These are used in patients with acute exacerbation of pain and inflammation with joint effusion. There are significant short term benefits (2-4weeks) in pain and function of joint. Patient should take complete bed rest after injection and should not lift weight at any condition. Side effect of these includes dermal de-pigmentation and skin atrophy (rare complication). **Note [**Drugs used are :- Triamcinolone, Methylprednisolone**]**
- **Hyaluronic-acid:** These are polysaccharides which are available in low as well as in high molecular weight. Intra-articular hyaluronic acid supplementation could help to improve synovial fluid viscoelasticity. These found to be more effective (in reducing pain) then intra-articular corticosteroids (5 weeks after injection till 12 months) and similar efficacy to NSAIDs (during 3-6 month after injection).
- **Topical creams and glucosamine sulphate: -** Creams are often used on knees and hand for moderate pain. Glucosamine sulphate is a nutrient supplement attracted a great deal of attention. In some countries like USA and in Europe this is used to relieve musculoskeletal symptoms and available in wide range of preparations and has some analgesic efficacy.[21] Mechanism of action of creams is unclear and these are not much effective on other parts of body.
- **Surgery:** Surgery is only used where medical therapy is not providing relief it should be resisted as much as possible. For articular cartilage defects autonomous cartilage transplantation is performed but as it is expensive, it is not used as first line treatment.[22]

Joint replacement is the final solution for people (Osteotomy may delay the joint replacement),[23] it provide pain free life, it is cost effective when compared to long term drug therapy but have other complications that arise with the replacement and postoperative functions are not achieved to the preoperative mark.[24]

## CONCLUSION

This review has summarised the detailed knowledge about osteoarthritis and its management. Osteoarthritis is acrucial public health problem mainly in old age group. It is very little known about the cause and mechanism underlying osteoarthritis, it have different progression in different people. At present it is managed by combination of drugs and patients are regularly monitored and counselled.

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