



An Insight Into Osteoarthritis

**Sowmya Sham
Kanneppady**

Department of Pharmacology, KVG Medical College and Hospital, Sullia, Karnataka, India.

**Sham Kishor
Kanneppady**

Department of Oral Medicine and Radiology, Century International Institute of Dental Science and Research Centre, Kasaragod, Kerala, India.

ABSTRACT

Osteoarthritis (OA) is the most common form of arthritis, affecting millions of people worldwide. Although OA can damage any joint in the body, the disorder most commonly affects joints in hands, knees, hips and spine. This review highlights the demographic data, risk factors and clinical manifestation of this chronic disease.

KEYWORDS

Osteoarthritis, musculoskeletal disorder, degenerative disease, chronic disability

INTRODUCTION

Osteoarthritis (OA) is the most common form of arthritis and remains one of the few chronic diseases of aging for which there is little, if any, effective treatment. It accounts for more mobility disability in the elderly than any other disease.^{1,2} It is defined as a degenerative, non-inflammatory joint disease characterized by destruction of articular cartilage and formation of new bone at the joint surfaces and margins. Osteoarthritis is an extremely common age related disorder affecting synovial joints (knees, hips, hands, spine) involving dysregulation of normal tissue turnover and repair affecting all tissues of the joint and leading to joint failure.³

DEMOGRAPHIC DATA

Global incidence: Osteoarthritis is already one of the ten most disabling diseases in developed countries. Worldwide estimates are that 9.6% of men and 18.0% of women aged over 60 years have symptomatic OA. 80% of those with OA will have limitations in movement, and 25% cannot perform their major daily activities of life. The incidence is estimated to be 100,000 new cases per year. ⁴ The risk of mobility impairments caused by knee OA alone is greater than that due to any other medical condition in people over 65.^{5,6} Community survey data in rural & urban areas of India shows the prevalence of OA to be in the range of 17 to 60.6 %.Among U.S. adults 30 years of age or older, symptomatic disease in the knee occurs in approximately 6% and symptomatic hip OA in roughly 3%.⁷

Gender distribution: Incidence of OA is higher among women in all age groups (0.29%) compared to men (0.17%). The incidence of radiological OA is highest among women between the ages of 65 and 74 (1.35%), and among men aged 75 years and over (0.9%). An exception is that OA of the hip is more common among men aged 45-64 years than among women.

Ethnic and geographic distribution: African American females are more prone than Caucasian females to OA of the knee but not of the hip. Osteoarthritis of the hip occurs more often in European Caucasians than in Jamaican blacks, African or South African blacks, Chinese or Asian Indians.

PREVALENCE

Symptomatic prevalence: Studies suggest that around 10% of people over 60 years of age report significant clinical prob-

lems as a result of OA. Pain is the most common symptom. On the basis of symptoms alone, the prevalence of knee OA is approximately 3% to 11%, and the prevalence of hip OA is approximately 3%.

Radiological prevalence: About 6% of adults aged above 30 have frequent knee pain and radiographic evidence of OA.⁸ Radiological evidence alone demonstrates that the prevalence of OA increases with age in all joints in men and women, with an overall prevalence of 7.7% to 14.3% in those aged 45 to 49 years, 30% to 41% in those aged 55 to 64 years, and 40% to 60% in those aged 75 to 79 years. Radiologically defined disease is present in at least one joint in more than 50% of people over the age of 65. The prevalence of OA increases with age, and the increase in the number of people over 65 years of age is contributing to the growing problem of OA worldwide.⁹

IMPACT OF OA

The World Health Organization (WHO) reports that 80% of people with osteoarthritis have some degree of limitation, with 25% unable to carry out activities of daily life. The major consequences of osteoarthritis are: pain, stiffness, loss of joint mobility, disability, reduced social interaction, deformity, decline in well-being, and to a limited extent, mortality.

Occupational effect: Occupations involving squatting or kneeling more than 2 hours per day were associated with an approximately two-fold significantly increased risk of moderate to severe radiographic knee OA .People who reported squatting more than 3 hours per day, compared to those who reported squatting < 30 min a day, had twice the likelihood of tibio-femoral OA.⁹ Farming 1-9 years increases the risk of osteoarthritis 4.5 times; farming 10 or more years increase the risk 9.3 times. Joint injury, frequent stair-climbing (15 or more flights per day) or frequent lifting of heavy weights (10 kg or more) was all associated with knee OA. People aged 35-64 years living in multi-storey buildings without elevators had a significantly higher prevalence of knee pain compared with those living in single-storey homes.¹⁰ Construction workers particularly floorers, are at significantly elevated risk for OA.¹¹

JOINTS AFFECTED BY OA

Osteoarthritis can affect any synovial joint, especially weight bearing joints like hip, knee, cervical and lumbosacral spine. ¹² It is also common in the frequently used small joints of the

hands and wrists, particularly the first Carpometacarpal (CMC) joints at the base of the thumbs. Often the dominant hand is more severely affected than the non-dominant hand. Other commonly affected joints include the distal interphalangeal (DIP) and proximal interphalangeal (PIP) joints of the hands. The shoulder and elbow are relatively spared.¹³

RISK FACTORS OF OA

Non modifiable factors:

Age: Diminished capacity for cartilage repair, hormonal changes and the cumulative effects of environmental exposures are possible age-related mechanisms

Gender: Women are more prone to developing OA than men. Gender differences are less marked after 80 years of age.

Family history: Children of parents with early onset OA or OA involving more than one joint are at increased risk of developing this condition.

Genetic factors: Hip and hand OA have genetic inheritance, knee OA has least genetic predisposition. Middle aged women with bilateral knee disease occurring at an early age have heritability up to 40%. Gene coding for frizzled-related protein-3 (FRZB) is associated with increased risk of hip OA in women. This gene product antagonises Wnt signaling proteins that play roles in the development of cartilage during growth and control chondrocyte maturation. Genome-wide scans have suggested that a gene conferring increased risk of OA lies within the IL-1 cluster on chromosome 2q.^{2,14,15}

Congenital joint anomalies: Congenital dislocated hip, an abnormality of the hip present at birth, is associated with the development of osteoarthritis of the hip.

Socioeconomic factors: Low socioeconomic level which is associated with less accessibility to health care system is more prone for disability and sufferings due to OA.

Bone-mineral density: High bone mineral density is associated with a higher prevalence of knee, hip and hand OA

Modifiable risk factors:

Obesity and over weight: The relation between weight and knee OA is stronger in women than in men and there is greater risk that both knees will be affected. Osteoarthritis of the knee is more likely to progress among overweight people compared to those who are not overweight. Excess body weight is associated with increased reports of pain related to hip OA.

Physical activity: Physical activity confers a range of health benefits including joint health, muscle strength and weight management. Moderate weight-bearing physical activities like recreational running are not risk factors for the development or the progression of knee OA.

Muscle strength: Small increases in the strength of the muscles, ligaments and tendons that stabilise the knee have been associated with improvement in knee pain and function. However, quadriceps strength does not appear to reduce the progression of knee osteoarthritis.

Joint injury: Individuals with a history of joint trauma or repetitive load-bearing activities are more likely to develop osteoarthritis of the knee and hip. Joint trauma occurring as a result of dislocations, contusions, fractures, tears of the menisci or ligaments, or as a result of surgical meniscectomy, precedes the development of OA in a large proportion of affected joints. **Estrogen levels:** Reduced oestrogen levels in post-menopausal women may be associated with the development of osteoarthritis

Nutritional factors: Antioxidants are thought to confer protection against the progression of osteoarthritis and other age-related diseases.

Cigarette smoking: Interestingly, protective influence of smoking on knee osteoarthritis has been reported¹⁶ which, however, may be subject to debate.

CLINICAL MANIFESTATIONS OF OA

- ❖ Pain, which is the predominant symptom is poorly localized and dull aching in nature, sharp or burning sensation when muscles and tendons are involved. Pain increases in cold climate, high humidity and drop in barometric pressure. Pain decreases on walking but worsens on prolonged/excessive use of joints.
- ❖ Muscle spasm and contractions of tendons
- ❖ Mild swelling
- ❖ Crepitus: coarse cracking sound when affected joint moves
- ❖ Joint effusion
- ❖ Minimal tenderness
- ❖ Early morning stiffness
- ❖ History of locking and giving way sensation due to presence of loose bodies in the joints
- ❖ In smaller joints of finger, hard bony enlargement called Heberden's nodes (DIP joint), Bouchard's nodes (PIP joints) can develop. These bony enlargements are nothing but osteophytes. These nodes are non-tender, but limit the joint movements.
- ❖ Osteoarthritis of the toes leads to the formation of bunions, which are red or swollen

CONCLUSION

Several therapeutic approaches are currently in vogue for the medical management of primary OA. Osteoarthritis often gradually worsens, and no cure exists. But staying active, maintaining a healthy weight and other treatments may slow down progression of the disease and help improve pain and joint function.

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