OSTEOARTHRITIS

OA

A type of joint disease that results from breakdown of joint cartilage and underlying bone.

⚠️ Risk factor ♂ Male & Female

About Osteoarthritis

Osteoarthritis (OA) is a type of joint disease that results from breakdown of joint cartilage and underlying bone (Pic. 1). The most frequently affected joints are the hands (Pic. 2), hips and knee joints. Damage from mechanical stress with insufficient self repair by joints is believed to be the primary cause of osteoarthritis. Osteoarthritis is closely associated with aging (Pic. 3), but its underlying mechanism is unclear. Hence, osteoarthritis is regarded as a naturally occurring irreversible phenomenon, rather than a specific, potentially treatable disease. However, OA is not inevitable for all senior adults (age 60+). The heritability (capability of being inherited) of osteoarthritis is estimated to be 40% to 65% and is higher for hand and hip OA than for knee OA.

Pathological changes seen in OA joints include progressive loss and destruction of articular cartilage (Pic. 4), thickening of the subchondral bone, formation of osteophytes, variable degrees of inflammation of the synovium, degeneration of ligaments and menisci of the knee and hypertrophy of the joint capsule (Pic. 5).

Joint pain is the cardinal symptom accompanied by varying degrees of functional alterations like joint stiffness and instability. Clinical presentations are diversified, depending on which joint is affected (Pic. 6), how severely it is affected, and the number of joints involved. The disease onset is usually slow, subtle and unrecognized, but at the later stages, symptoms can be overt and debilitating.

Diagnosis is typically based on signs and symptoms, with medical imaging (Pic. 7) and other tests occasionally used to either support or rule out other problems. Unlike other types of arthritis, only the joints are typically affected. In contrast to rheumatoid arthritis, which is primarily an inflammatory condition, in osteoarthritis, the joints do not typically become hot or red.

Lifestyle modification (such as weight loss and exercise) and analgesics are the mainstays of treatment. Acetaminophen (also known as paracetamol) is recommended first line with nonsteroidal anti-inflammatory drugs (NSAIDs) being used as add on therapy only if pain relief is not sufficient. This is due to the relative greater safety of acetaminophen.

Symptoms

The predominant symptoms are pain, a decreased joint range of motion (ROM) and stiffness, periarticular (around the joints) muscle weakness and atrophy, joint effusion and swelling, and physical disability. Initially, symptoms may occur only following exercise, but over time may become constant.

Associated diseases

Obesity

The development of osteoarthritis is correlated with an obesity, especially with respect to knees. Since the correlation with obesity has been observed not only for knees but also for non-weight bearing joints and the
loss of body fat is more closely related to symptom relief than the loss of body weight, it has been suggested that there may be a metabolic link to body fat as opposed to just mechanical loading.

**Metabolic syndrome**

Metabolic syndrome is associated with an increased risk of cardiovascular disease (CVD) and its prevalence is increased in OA subjects. However, metabolic syndrome lacks a single definition as several definitions have been proposed. Insulin resistance appears to be a major criteria in all definitions, associated with others including obesity (increased waist circumference), dyslipidemia (based on elevated triglyceride levels and/or decreased HDL-cholesterol levels), and hypertension (high blood pressure). Notably, the prevalence of metabolic syndrome is increased in OA subjects. Moreover, OA has been associated with several components of metabolic syndrome such as obesity, hypertension, dyslipidemia and type 2 diabetes, alone or in combination: for example, diabetes, hypertension and obesity may be synergistic on the risk of hand OA in middle-aged individuals. Moreover, an increased risk of hand OA was also found in overweight individuals.

**Cardiovascular disease**

The underlying mechanisms behind the observed association between OA and cardiovascular disease risk remain unclear, but several factors may account for this relationship.

First, the two diseases have some shared risk factors, including hypertension, diabetes, hypercholesterolemia, and obesity.

Second, the most commonly prescribed drugs to relieve pain in OA patients are non-steroidal anti-inflammatory drugs (NSAIDs), and NSAIDs have been related to an increased risk of vascular events.

Third, OA patients are less physically active because of severe pain in the joints compared with the general population, particularly those with knee or hip OA. Physical inactivity is among the leading risk factors for CVD. Finally, the most important pathological features of CVD include arterial thickening, stiffness, and atherosclerosis, which contribute to inadequate tissue perfusion (ischemia). Ischemia of the bone decreases cartilage nutrition and induces multiple bone infarcts, which are characteristics of advanced OA. This effect of ischemia of the bone is one potential explanation of the interrelationship between OA and CVD.

**Complications**

Osteoarthritis is the most common joint disease, causing disability and reduction of quality of life and participation in social activity.

**Joint damage**

Other structures within the joint can also be affected. The ligaments within the joint become thickened and fibrotic and the menisci can become damaged and wear away. All these changes can cause problems functioning.

**Morbidity**

Osteoarthritis is also a major cause of morbidity and healthcare expenditures and affects approximately 15% of the population. By age 65, 80% of the population has radiographic evidence of osteoarthritis, and 60% are experiencing symptoms of osteoarthritis.

**Risk factors**

**Aging**

One of the most common risk factors for OA is age. A majority of people over the age of 65 were diagnosed with radiographic changes in one or more joints.

**Obesity**

The association between obesity and OA has long been recognized. Patients with obesity develop OA earlier and
have more severe symptoms, higher risk for infection and more technical difficulties for total joint replacement surgery.

**Sport injury**

Trauma-related sport injuries can negatively affect joint stabilization. Knee injury is the major cause of OA in young adults, increasing the risk for OA more than four times (Pic. 8).

**Inflammation**

It has been established that the chronic low-grade inflammation found in OA contributes to disease development and progression.

**Genetic predisposition**

An inherited predisposition to OA has been known for many years from family-based studies. Although the genetics of OA are complex, the genetic contribution to OA is highly significant. Over the past decade, the roles of genes and signaling pathways in OA pathogenesis have been demonstrated.

**Prevention**

Exercise encompasses physical activity (habitual, sporting), and exercise programmes to improve and maintain joint health.

Benefits of moderate exercise (Pic. 9) include weight control and joint health (beneficial for cartilage). Specific exercises aim to achieve optimal biomechanics to protect joints (joint alignment, load reducing strategies) and improve muscle strength, endurance, power, flexibility and co-ordination.

Other physiotherapy principles include sport/task specific exercises, personalised medicine (exercises tailored for the individual) and neuromuscular control of movement (screening and retraining using specific exercises). Manual therapy techniques (pain management, mobilisations, muscle stretching) can improve exercise outcomes. Effects of exercise on pain and function are comparable with those for non-steroidal anti-inflammatory drugs.

**How it can affect fertility**

Although osteoarthritis does not have the direct influence on the fertility, the pregnancy rates progressively decrease with increasing body mass index (BMI) related to obesity. The effects of obesity not only relate to chronic medical conditions but also have been strongly related to reproductive problems. Obese women have an increased risk of anovulation, menstrual disturbances, infertility, and polycystic ovarian syndrome (PCOS). PCOS is the primary cause of hyperandrogenism (high male sex hormones) and oligo-anovulation at the reproductive age and is often associated with infertility with the prevalence between 70 and 80%. Thus, if ovulation does not occur, the fertilization is avoided.

Paternal obesity negatively affects male fertility and assisted reproduction outcomes, as shown by significantly reduced fertility in the general population and reduced rates of live birth from assisted reproductive techniques (ART), as well as increased rates of nonviable pregnancy. The mechanisms that explain the relation between obesity and male infertility are not fully understood.

**Prognosis**

Osteoarthritis itself does not cause infertility directly, but it is related to the comorbidities that do so. Osteoarthritis is a chronic, slowly progressive disease and is almost ubiquitous with advancing age. There is no cure, but a combination of different modalities of treatment can provide adequate pain control and preserve function and quality of life for many patients. Despite treatment, most patients usually continue to have some degree of pain and functional limitation affecting their desired activities and quality of life. Complications of
medication, particularly NSAIDs, are also problematic. In patients who do not respond to medical and nonmedical therapies, total joint replacement provides good long-term pain relief for most people.

**Find more about related issues**

**Diagnoses**

**Obesity**
A disease of excess body fat that can have a negative effect on health, leading to reduced life expectancy and other health problems. Learn more at: [www.fertilitypedia.org/therapy/diag/obesity](http://www.fertilitypedia.org/therapy/diag/obesity)

**Gallery**

**Pic**
Osteoarthritis is a degenerative joint disease that lead to the damage of joint cartilage

- Normal Knee
- Osteoarthritis

**Pic**
The formation of hard knobs at the middle finger joints (known as Bouchard’s nodes) and at the farther away finger joint (known as Heberden’s node) are a common feature of osteoarthritis in the hands.

**Pic**
Histopathology of osteoarthrosis of a knee joint in an elderly female.

**Pic**
(a) cartilage erosion (b) cartilage ulceration (c) cartilage repair (d) osteophyte (bone spur) formation.
Pic
Osteoarthritis most often occurs in the hands (at the ends of the fingers and thumbs), neck, lower back, knees, and hips.
Secondary osteoarthritis (due to an old injury with fracture) of the ankle in a woman of 82 years old.

People with osteoarthritis should do different kinds of exercise for different benefits to the body.

Sources

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