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KNEE OSTEO ARTHRITIS - AN OVERVIEW

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Abstract
Osteoarthritis (OA) or degenerative joint disease, is one of the oldest and most common type of arthritis. With research continuing on all arthritic disorders, OA is no longer believed to be a wear and tear disease that is a normal consequence of aging. Although aging does lead to decreasing quality and quantity of the proteoglycans in articular cartilage, the changes seen in the cartilage of asymptomatic adults are quite different from those found in people with OA. OA is now recognized as a chronic, progressive, process in which new tissue is produced in response to joint insults and cartilage deterioration.

Key words: osteoarthritis

INTRODUCTION

The musculoskeletal system allows the human body to maintain its upright posture, to move freely, and to function independently. Bone is a vital, dynamic connective tissue that serves three major functions, it provides framework for movement and protection of internal organs, it performs a major role in metabolism and mineral homeostasis, and it serves as the primary site of hematopoiesis. Disorders of the musculoskeletal system cause considerable morbidity, lead to decreased quality of life and often result in reduced life expectancy.

The term osteoarthritis was coined by John Spendon. Though Osteoarthritis affects any joint it mainly affects synovial joints. It is more common in the weight bearing joints like the hip, knee, spine etc. Osteoarthritis 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.

General features

It commonly affects knee joint, All races are susceptible, Common in older age groups, 80% of people are affected by 40 years, but only 40% show symptoms, more than 50% have bilateral OA of knee[10].

Epidemiology of osteoarthritis

OA is by far the most common joint disorder, one of the most common chronic disease in the elderly and a leading cause of disability. Prevalence in men is slightly higher in the younger age group (before 45 years of age) whereas women are affected more commonly at ages older than 55 years except for disease of the hip. There is a familiar pattern of inheritance with distal inter phalangeal joint involvement in nodal osteoarthritis and also in primary generalized osteoarthritis[1].

It occurs worldwide, but with a variable distribution, for example, hip osteoarthritis is less common and knee osteoarthritis is more common in Asians than in Europeans Racial and genetic factors are also important in osteoarthritis prevalence and pattern. Chinese, Jamaican blacks, South Africans and Asian Indians have a lower incidence of osteoarthritis of the hip than whites whereas Japanese have an increased incidence of congenital hip dysplasia. Black women have a higher prevalence of knee osteoarthritis than white women but a lower prevalence of involvement of the distal inter phalangeal joints of the hand (Heberdens nodes)[6].

In 2019, about 528 million people worldwide were living with osteoarthritis; an increase of 113% since 1990. About 73% of people living with osteoarthritis are older than 55 years and 60% were females[4].

The prevalence of osteoarthritis in India ranging from 22% to 39% in different parts of the country. Approximately 45% of women over the age of 65 have osteoarthritis[5].

Causes of OA

Osteoarthritis may occur as an idiopathic (formerly primary) or secondary osteoarthritis disorder. The cause of primary osteoarthritis is unknown. Secondary osteoarthritis is caused by

* Trauma, sprains, strains, joint dislocations, and fractures.
* Long term mechanical stress – athletics, ballet dancing or repetitive physical tasks.
* Inflammation in joint structures
* Joint instability from damage to supporting structures
* Neurologic disorders (eg. Diabetic neuropathy, charcot neuropathic joint) in which pain and proprioceptive reflexes are diminished or lost.
* Congenital or acquired skeletal deformities.
* Hematologic or endocrine disorders such as hemophilia, which causes chronic bleeding into the joints or hyper-parathyroidism which causes bone to lose calcium.
* Drugs (Colchicine, Indomethacin, Steroids) that stimulates the collagen digesting enzymes in the synovial membrane[17]

Risk factors of OA

Obesity – predicts later risk of radiological and symptomatic OA in population studies.
Heredity – familial tendency to develop nodal and generalized OA.
Gender – poly articular OA is more common in women, a higher prevalence after the menopause suggests a role for sex hormones.
Hypermobility – increased range of joint motion and reduced stability lead to OA.
Other diseases – Septic arthritis, Paget's disease, Acromegaly, Chondrocalcinosis, Sero negative spondylo arthropathy.
Trauma – a fracture through any joint and Meniscal and cruciate ligament tears cause OA of the knee.
Congenital joint dysplasia – alters joint biomechanics and leads to OA, mild acetabular dysplasia is common and leads to earlier onset of hip OA
Joint congruity - congenital dislocation of the hip or a slipped femoral epiphysis or Perthe's disease.
Osteonecrosis of the femoral head in children and adolescents causes early onset of OA.
Occupation – Miners develop OA of the hip, knee and shoulder, cotton workers OA of the hand and farmers OA of the hip.
Sport – repetitive use and injury in some sports causes a high incidence of lower limb OA[9].

Classification of OA

I. Classification by the joints involved:

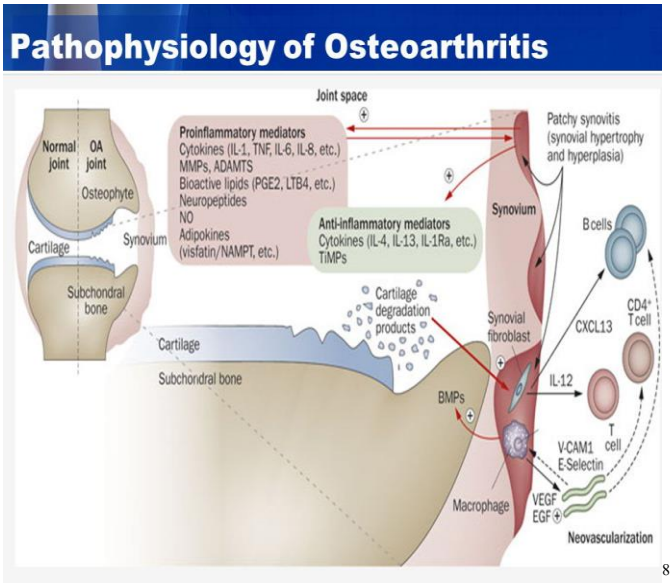
a. Mono articular, Oligo articular or Poly articular (generalized).
b. Chief joint site (index joint site) and localization within the joint.
    i) Hip (superior pole, medial pole or concentric)
    ii) Knee (medial, lateral, patella femoral compartments).

iii) Hand (interphalangeal joints and or thumb base).
iv) Spine (apophyseal joints or intervertebral disk disease).
v) Others

II. Classified into Primary OA(idiopathic) and Secondary OA
III. Classification by the presence of specific features:

i) Inflammatory OA
ii) Erosive OA
iii) Atrophic or destructive OA
iv) OA with chondrocalcinosis
v) Others

Pathophysiology of OA:



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Clinical features of OA
Symptoms includes joint pain, joint gelling (stiffening and pain after immobility), joint instability and loss of function. And important signs are joint tenderness, crepitus on movement, limitation of range of movement, joint effusion and variable levels of inflammation, bony swelling and wasting of muscles. As a consequence of reduced movements, muscles lose strength and people become less able to perform the activities. So being decreased physical activities may lead to other medical conditions like cardio vascular disease, obesity and diabetes. In severe cases, as the joint is unused and causes long term pain even at rest. This makes the people unable to do the household work and indulge in social activities. Hence it affects the quality of life of OA people.

Diagnosis of OA
A bone scan, CT scan, MRI imaging, X-rays, synovial fluid analysis and arthroscopy identifies soft tissues swelling and history.

Management
Because OA has no cure, collaborative care focuses on managing pain and inflammation, preventing disability and maintaining and improving joint function. Nondrug interventions are foundation for OA management and should be maintained throughout the patient's treatment period.

Rest and joint protection:
The OA patient must understand the importance of a balance of rest and activity. The affected joint should be rested during any periods of acute inflammation and maintained in a functional position with splints or braces[15].

Heat and cold applications:
Application of heat or cold may help to reduce complaints of pain and stiffness. Heat therapies including hot packs, whirlpool baths, ultrasound and paraffin wax baths helping for relieving stiffness[16].

Nutritional therapy
If the patient is over-weight, a weight reduction program is a critical part of treatment plan[7].

Exercises:
Is a fundamental part of OA management and it strengthens the affected joints and muscles and help for mobility. It includes aerobic exercises, range of motion exercises, isometric and isokinetic exercises and specific program for muscle strengthening exercises were beneficial for the patients with knee OA[12 & 14].

Braces and Assistive devices
When the movement becomes painful, braces and assistive devices like walker and walking stick is useful and make independent[13].

Complementary and alternative therapies
It includes acupressure, acupuncture, movement therapies such as yoga and Tai chi, TENS (trans-cutaneous electrical nerve stimulation), nutritional therapies like glucosamine, bio magnetic therapy, herbal t harpy, massage therapy. Other therapies include guided imagery and therapeutic touch[19].
Drug therapy includes Acetaminophen, NSAIDS, Antibiotics, Intra articular corticosteroids and opioid analgesics[11].
Surgical procedures includes Arthroscopy (debridement by smoothing rough cartilage and flushing out the joint to remove debris), Osteotomy (an incision into the joint may be performed to realign the affected joint), joint arthroplasty is a reconstructive or replacement of a joint.

Prevention of OA
Avoiding trauma to joints, avoid cigarette smoking, maintain healthy weight, use safety measures to protect and maintain trauma to joints, and exercises regularly including strength and endurance training.

Ten self-help techniques:
* **Positive mental attitude:** Patient is told to focus on things other than pain and their own body. They are encouraged to think positively.

* **Regular medication:** Patient is told the value of regular and correct medication.

* **Regular exercises:** Patient should follow a regular and appropriate exercise program, most suited for themselves.

* **Use of joints:** Patient is told about the value of correct posture and the methods of using the joints wisely to reduce stress on the painful joints.

* **Energy conservation:** Patients are instructed to listen to the body's "inner signals" for rest. Slowing down and avoiding too many activities reduces the stress and strain on the joints.

* **Assistive devices:** Devices like splints, braces and walking sticks(contra lateral hand) can helps to stabilize the joints, provide strength and reduce pain .

***Adequate sleep:** A good adequate sleep provides rest to the ailing joints and reduces the pain and swelling.

* **Massage:** A good moderate massage brings warmth and relieves pain due to arthritis.

* **Relaxation techniques:** Relaxation techniques like yoga, meditation etc, help to relax the muscles, mind and controls respiration, heart rate, blood pressure. This helps in the control of pain.

* **Modification in the daily activities**
Using western toilets, bath aids and railings, long handle broomstick and mop to clean the floors, use of walking sticks while walking, climbing etc, high chairs enable them to get in and out with ease, avoid squatting on the ground for food etc, use of dining table and chairs are recommended, to avoid squeezing clothes after washing and just rinsing them dry, to avoid walking on hard and uneven and rough surfaces, to sleep on a hard surface[18].

Conclusion
Thus, a nurse by her intelligent, compassionate and prudent approach can help an arthritis patient to cope well with this difficult disease. Such thus has a greater and effective role to play in the treatment of this severe form of arthritis.

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