OSTEOARTHRITIS – A PRACTICAL CLINICAL UPDATE

Including guidelines based on guidance issued by National Institute of Clinical Excellence (NICE)

Bhaskar Dasgupta
Consultant Rheumatologist
Southend University Hospital
United Kingdom

Osteoarthritis

- Commonest type of joint disease
- Heterogeneous group of conditions with common histopathologic and radiologic changes.
- Knees, hips and small hand joints most affected.
- Causes Pain, reduced function and participation restriction
- Structural changes often without accompanying symptoms.
- Not **caused** by ageing and does not necessarily deteriorate.
- Pathology due to excessive biochemical breakdown of articular cartilage in the synovial joints.
- Inflammatory changes may also occur.

Classification: Primary or Secondary

- **Secondary** OA refers to degenerative disease of the synovial joints that results from a primary predisposing condition, usually trauma,
- Adversely altered articular cartilage and/or subchondral bone of the affected joints.
- Secondary OA often occurs in relatively young individuals.

Pathology

- Primary and secondary osteoarthritis are not separable on a pathologic basis.
- Degenerative alterations primarily begin in the articular cartilage,
- As a result of either excessive loading of a healthy joint or relatively normal loading of a previously disturbed joint.
- External forces accelerate the catabolic effects of the chondrocytes and disrupt the cartilaginous matrix.

Pathology of OA

- **Enzymatic destruction** increases cartilage degradation, decreased proteoglycans and collagen synthesis.
- **Changes in the proteoglycans** render the cartilage less resistant to compressive forces in the joint and more susceptible to the effects of stress.
- The decreased strength of the cartilage is compounded by **adverse alterations of the collagen**.
- **Elevated levels of collagen degradation** place excessive stresses on the remaining fibers, eventually leading to **mechanical failure**.
- The **diminished elastic return and reduced contact area of the cartilage**, coupled with cyclic joint loading, causes the situation to worsen over time.

Factors that contribute to the development of OA

- • Genetic and Hormonal Factors
- • Mechanical Factors
- • Cellular and Metabolic Factors
- • Biochemical Abnormalities

Impact of OA

- **Frequency**
- Approximately 80-90% of individuals older than 65 years have evidence of primary OA.
- **Morbidity**
- Osteoarthritis typically develops slowly and progresses over several years.
- Usually, the pain slowly worsens over time, but it may stabilize in some patients.
- Osteoarthritis of the knee is a leading cause of disability in elderly persons.
- OA is the commonest cause of absence from work because of back pain.

Gender

- In individuals older than 55 years, the prevalence of osteoarthritis is higher among women than men.
- Women are especially susceptible to osteoarthritis in the distal interphalangeal joints of the fingers.
- Women also have osteoarthritis of the knee joints more frequently than do men
- Women are more prone to erosive osteoarthritis with a female-to-male ratio of about 12:1.

Age

- Osteoarthritis occurrence appears to increase with patient age, in a nonlinear fashion. The prevalence of the disease increases dramatically after the age of 50 years, likely because of the following factors:
- Alterations in collagen
- Alterations in proteoglycans decrease the tensile strength of the joint cartilage.
- There is also diminished nutrient supply to the cartilage.

Symptoms

- Deep, achy, joint pain exacerbated by extensive use is the primary symptom.
- Also, reduced range of motion and crepitus are frequently present.
- Joint malalignment may be visible.
- Heberden nodes, which represent palpable osteophytes in the distal interphalangeal joints, are characteristic in women but not men.
- Inflammatory changes are typically absent or at least not pronounced.

SUBSETS OF PRIMARY OA

Primary generalised OA

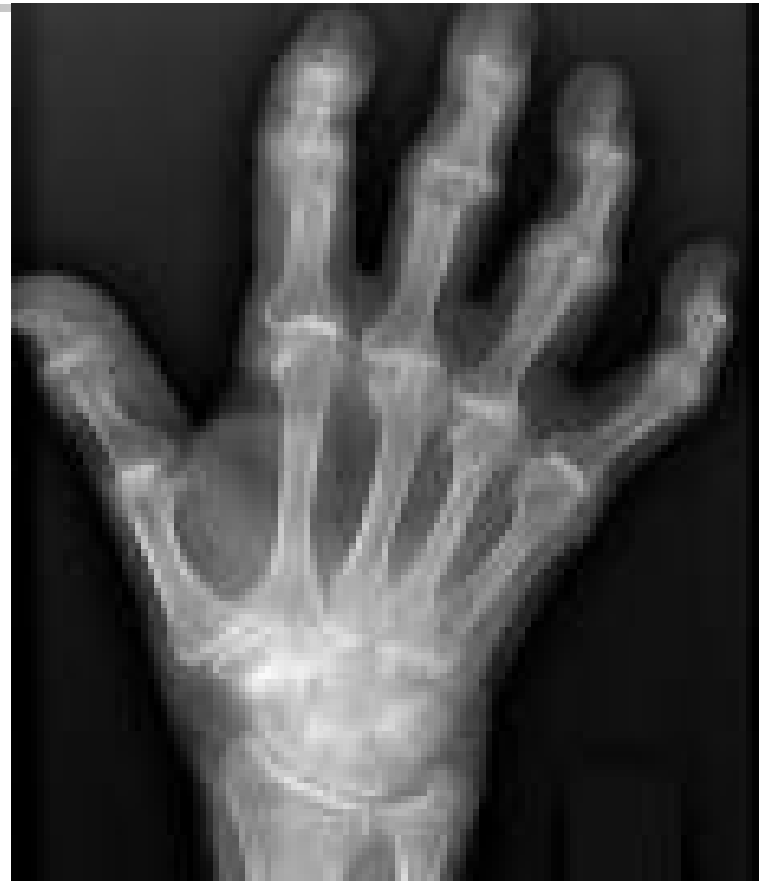
- Kellgren and Moore described in 1952.
- Familial and premature development of Heberden and Bouchard nodes
- as well as the precocious degeneration of the articular cartilage of multiple other joints, including the first carpometacarpal joints, knee joints, hip joints, and spine articulations.
- The radiographic appearance of PGOA is indistinguishable from that of nonfamilial primary osteoarthritis
- Typically progresses rapidly and appears severe on images.

RADIOGRAPHY

- **Different** abnormalities are found in parts of joints
- **Pressure** (ie, contact) areas – joint space loss, sub-chondral sclerosis, bony cyst formation
- Different from **inflammatory** arthritis where **uniform** joint space loss is the rule
- For example- in OA knee medial femoro-tibial compartment usually involved
- **Nonpressure** areas – osteophytes
- **Bilateral** symmetry is often seen in cases of primary osteoarthritis, particularly when the hands are affected.

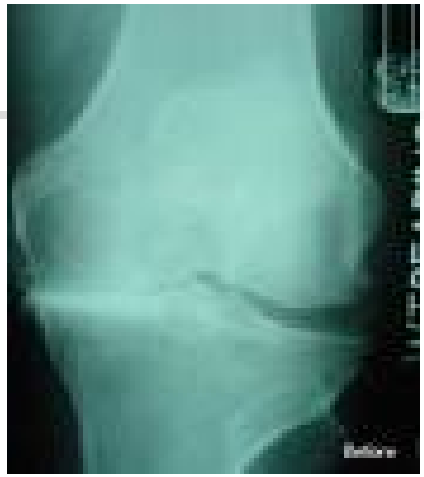
Hands

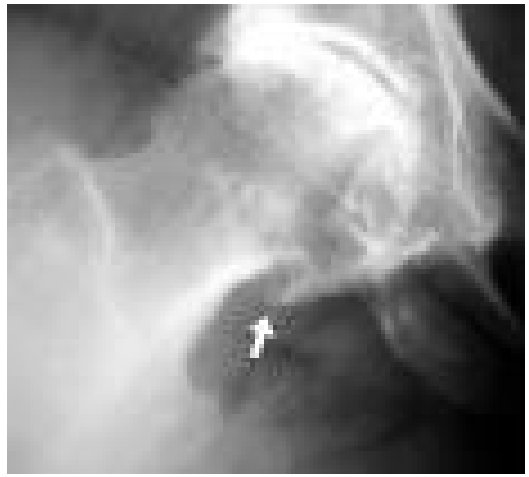
- **primary OA** is most commonly seen in the hands.
- Bilateral symmetry is generally observed, with multiple fingers on each hand affected.
- **Heberden** nodes refer to bony prominences at the DIPJ
- **Bouchard** nodes bony outgrowths at the PIPJ
- First CMCJ affected , radial subluxation of the metacarpal.
- The scaphotrapezium and scaphotrapezoid joints
- IPJ asymmetrically affected, radial/ulnar deviation



Radiography

- **Knee** Weight bearing views ,load –line views, axial views
- **Hip:** the superior aspect of the joint is typically the most narrowed; axial and medial migration of the femoral head is less commonly seen.





Erosive (inflammatory) OA

- Primary OA marked by a greater inflammation, erosive abnormalities and, in some cases, osseous ankylosis.
- Most commonly in postmenopausal women - hereditary.
- Bilateral and symmetrical, and it occurs in the IPJ of hands
- Rarely, patients may have erosive OA at base of the first metacarpal or even in the feet.
- **Central erosions** in contrast to the marginal erosions in rheumatoid arthritis.
- **Osteophytes** ; IPJ may assume a **gull-wing configuration,** with central erosions flanked by raised lips of bone.
- Periarticular soft-tissue swelling – synovitis on MSUS.

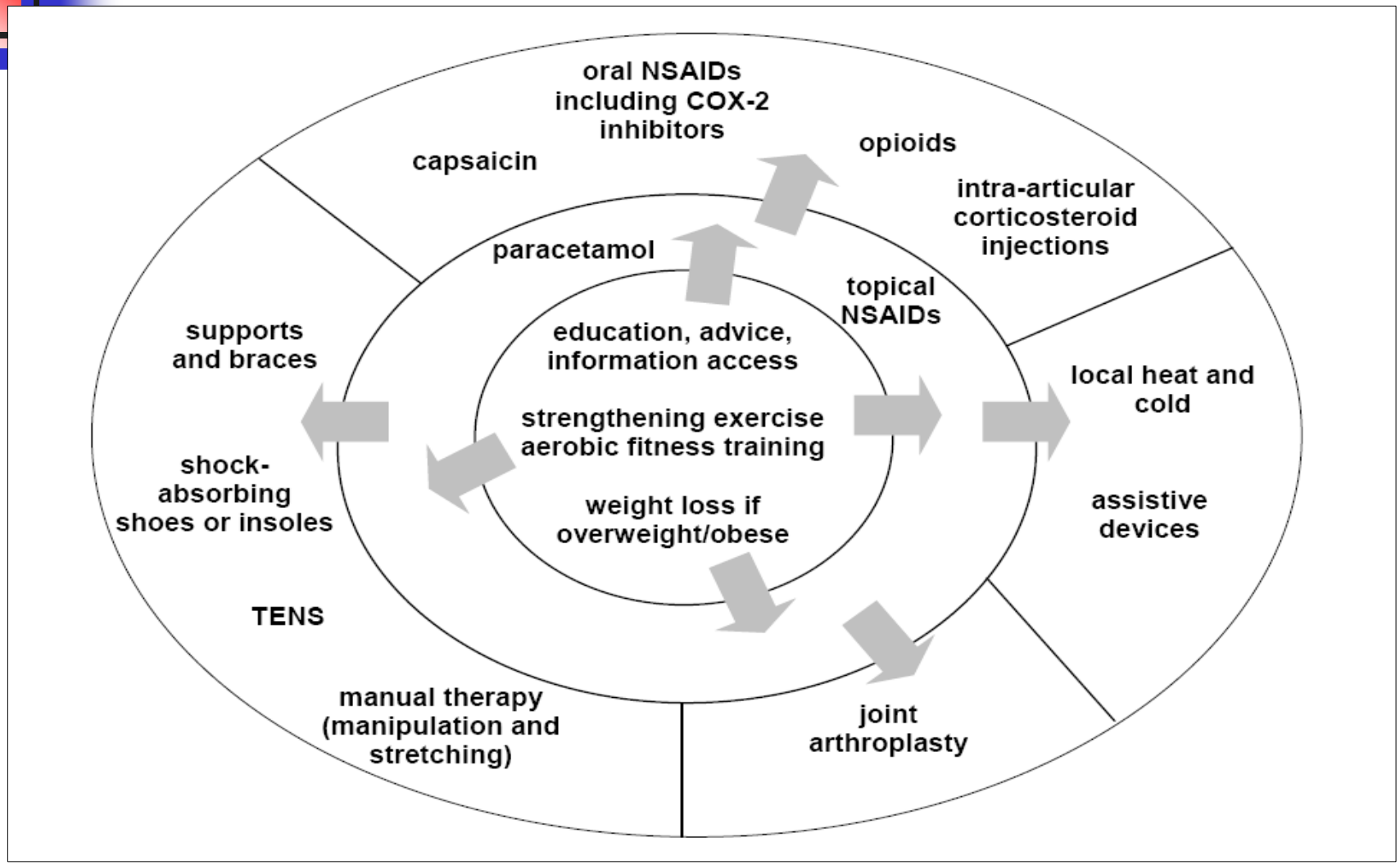
Chondromalacia patellae

- Seen in young adults
- Crepitus and pain anterior knee associated with cartilaginous changes along the under surface of the patella.
- Conventional radiographs provide little information.
- MRI to be the initial imaging study of choice.
- Fast spin-echo images or gradient-echo images can be used to detect
- cartilaginous ulceration, which is classically focal and located along the medial facet of the patella.

DIFFERENTIAL DIAGNOSES

- Reiter Syndrome
- Ankylosing Spondylitis
- Avascular Necrosis Femoral Head
- Calcium Pyrophosphate Deposition Disease
- Gout
- Neuropathic Arthropathy (Charcot Joint)
- Psoriatic Arthritis
- Rheumatoid Arthritis, Hands

NICE appraisal for Osteoarthritis (February 2008)



Key Points

- Assess the effect of OA on function, quality of life, occupation, mood, relationships, and leisure activities.
- **Patient –centred approach:** The care plans should take into account p**atient needs and preferences** and patients should be given e**ducation and information** on OA and its treatment.
- **Exercise**- should be a core treatment , irrespective of age, comorbidity, pain severity or disability. Exercise should include:
- local muscle strengthening
- general aerobic fitness.
- **Arthroscopic lavage and debridement should not be offered** except for knee OA with a clear history of mechanical locking (not gelling, ‘giving way’ or X-ray evidence of loose bodies).

Therapy

- **Paracetamol** for pain relief - regular dosing may be required.
- **Topical non-steroidal anti-inflammatory drugs (NSAIDs)** should be considered ahead of oral NSAIDs, cyclo-oxygenase 2 (COX-2) inhibitors or opioids.
- **Oral NSAID/COX-2 inhibitor**- the first choice should be either a standard NSAID or a COX-2 inhibitor. In either case, these should be co-prescribed with a proton pump inhibitor (PPI)
- **Referral for criteria for joint replacement surgery**

Education and self-management

- **Patient information – verbal/written**
- to enhance understanding of the condition and its management, and to counter misconceptions, such as that it inevitably progresses and cannot be treated.
- **Patient self-management interventions**
- Individualised self-management strategies should be agreed between healthcare professionals and the person with osteoarthritis.
- Positive behavioural changes, such as exercise, weight loss, use of suitable footwear and pacing
- Self-management programmes, either individually or in groups, should emphasise the recommended core treatments for people with osteoarthritis, especially exercise.

Additional therapies

- **Thermotherapy**
- The use of local heat or cold should be considered as an adjunct to core treatment.
- **Exercise and manual therapy**
- Exercise should be a core treatment for people with osteoarthritis, irrespective of age, comorbidity, pain severity or disability. Exercise should include:

- local muscle strengthening, and
  general aerobic fitness.
- Manipulation and stretching should be considered as an adjunct to core treatment, particularly for osteoarthritis of the hip.
- **Weight loss**
- Interventions to achieve weight loss should be a core treatment for people who are obese or overweight.

Additional therapies

- **Electrotherapy**
- Healthcare professionals should consider the use of transcutaneous electrical nerve stimulation (TENS)2 as an adjunct to core treatment for pain relief.
- **Acupuncture**
- Electro-acupuncture should not be used to treat people with osteoarthritis.
- **Aids and devices**
- **Footwear** (including shock-absorbing properties) for people with lower limb OA.
- OA with biomechanical joint pain or instability should be considered for assessment for **bracing / joint supports / insoles** as an adjunct to their core treatment.
- **Assistive devices** (for example, walking sticks and tap turners) should be considered as adjuncts to core treatment for specific problems with activities of daily living.

Nutraceuticals

- The use of glucosamine or chondroitin products is not recommended for the treatment of osteoarthritis.

Invasive treatments for knee osteoarthritis

- **Referral for arthroscopic lavage** and debridement should not be offered as part of treatment
- unless
- the person has knee OA with a clear history of mechanical locking (not gelling, ‘giving way’ or X-ray evidence of loose bodies).

Pharmacological management of osteoarthritis

- **Oral analgesics**
- Paracetamol and/or topical non-steroidal anti-inflammatory drugs (NSAIDs) should be considered ahead of oral NSAIDs, cyclo-oxygenase 2 (COX-2) inhibitors or opioids.
- If paracetamol or topical NSAIDs are insufficient for pain relief for people with osteoarthritis, then the addition of opioid analgesics should be considered. Risks and benefits should be considered, particularly in elderly people.
- **Topical treatments**

  Topical NSAIDs for pain relief in addition to core treatment for people with knee or hand osteoarthritis.
- Topical capsaicin should be considered as an adjunct to core treatment for knee or hand osteoarthritis.
- Rubefacients are not recommended for the treatment of osteoarthritis.

NSAIDs and highly selective COX-2 inhibitors

- The recommendations in this section are derived from extensive health-economic modelling, which included December 2007 NHS drug tariff costs.
- This has led to an increased role for COX-2 inhibitors, an increased awareness of all potential adverse events (gastrointestinal, liver and cardio-renal) and a
- recommendation to co-prescribe a proton pump inhibitor (PPI).
- Where paracetamol or topical NSAIDs provide insufficient pain relief for people with osteoarthritis, then the addition of an oral NSAID/COX-2 inhibitor to paracetamol should be considered.
- Oral NSAIDs/COX-2 inhibitors should be used at the **lowest effective dose for the shortest possible period of time.**

NSAID/COX-2 INH

- When offering treatment with an oral NSAID/COX-2 inhibitor, the first choice should be either a standard NSAID or a COX-2 inhibitor.
- Co-prescribed with a PPI
- All oral NSAIDs/COX-2 inhibitors have similar analgesic effects but vary in their potential GI, liver and cardio-renal toxicity
- Consider individual patient risk factors, including age.
- Appropriate assessment and/or ongoing monitoring
- **Low-dose aspirin:** consider other analgesics before adding NSAID/COX-2 inhibitor (with a PPI) if pain relief is ineffective or insufficient.

Intra-articular injections

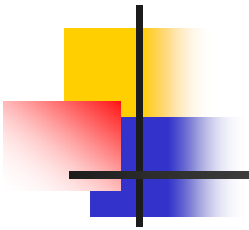
- Intra-articular **corticosteroid** injections should be considered as an adjunct to core treatment for the relief of moderate to severe pain in people with osteoarthritis.
- Intra-articular **hyaluronan** injections are not recommended for the treatment of osteoarthritis.

Criteria for surgery

- **Referral for joint replacement** surgery
- Joint symptoms **(pain, stiffness and reduced function) that have a substantial impact on quality of life and are refractory to non-surgical treatment.**
- **Referral should be made before there is prolonged and established functional limitation and severe pain.**
- Patient-specific factors (including age, gender, smoking, obesity and comorbidities) should not be barriers to referral for joint replacement surgery.
- Referral thresholds should be based on discussions between patient representatives, referring clinicians and surgeons, rather than using current scoring tools for prioritisation.

The Future

- DMOADs ?
- Stem cell therapies?



- Thank You