The goals of osteoarthritis treatment include pain alleviation and improvement of functional status, writes Adrian Gibbs

Osteoarthritis is the most common type of joint disease. It represents a heterogeneous group of conditions that result in common histopathologic and radiologic changes. It is a degenerative disorder that results from the biochemical breakdown of articular cartilage in the synovial joints. However, the current concept holds that osteoarthritis involves not just the articular cartilage but the entire joint organ, including the subchondral bone and synovium.

Osteoarthritis predominantly involves the weight-bearing joints, including the knees, hips, cervical and lumbosacral spine, and feet. Other commonly affected joints include the distal interphalangeal (DIP) and proximal interphalangeal (PIP) joints of the hands.

Although osteoarthritis is thought to be largely due to excessive wear and tear, secondary non-specific inflammatory changes may also affect the joints. Therefore, the term degenerative joint disease is no longer appropriate when referring to osteoarthritis.

Historically, osteoarthritis has been divided into primary and secondary forms, although this division is somewhat artificial. Secondary osteoarthritis is conceptually easier to understand. It refers to degenerative disease of the synovial joints that results from some predisposing condition, usually trauma, that has adversely altered the articular cartilage and/or subchondral bone of the affected joints. Secondary osteoarthritis often occurs in relatively young individuals.

The definition of primary osteoarthritis is more nebulous. Although primary osteoarthritis is related to the ageing process and typically occurs in older individuals, in the broadest sense of the term, it is an idiopathic phenomenon, occurring in previously intact joints and having no apparent initiating factor.

Some clinicians limit primary osteoarthritis to the joints of the hands (specifically the DIP and PIP joints and joints at the base of the thumb), whereas others include the knees, hips, spine and hands as potential sites of involvement. As underlying causes of osteoarthritis are discovered, the term primary, or idiopathic, osteoarthritis may become obsolete. For instance, many investigators believe that most cases of primary osteoarthritis of the hip may, in fact, be due to subtle or even unrecognisable congenital or developmental defects.

No specific laboratory abnormalities are associated with osteoarthritis; it is typically diagnosed on the basis of clinical and radiographic findings.

The goals of osteoarthritis treatment include pain alleviation and improvement of functional status; non-pharmacologic interventions are the cornerstones of osteoarthritis therapy and include patient education, temperature modalities, weight loss, exercise, physical therapy, occupational therapy, and joint unloading in certain joints (eg. knee, hip). Intra-articular pharmacologic therapy includes corticosteroid injection and viscosupplementation, which may provide pain relief and have an anti-inflammatory effect on the affected joint.

Risk factors for osteoarthritis include the following: age; obesity (increases mechanical stress); trauma; genetics; sex hormones; muscle weakness; repetitive use (ie. jobs requiring heavy labour and bending); infection; crystal deposition; acromegaly; previous rheumatoid arthritis (ie. burnt-out rheumatoid arthritis); heritable metabolic causes (eg. alkaptonuria, haemochromatosis, Wilson disease); haemoglobinopathies (eg. sickle cell disease, thalassaemia); neuropathic disorder leading to a Charcot joint (eg. syringomyelia, tabes dorsalis, diabetes); underlying orthopaedic disorders (eg. congenital hip dislocation, slipped femoral capital epiphysis); and disorders of bone (eg. Paget’s disease, avascular necrosis).

Pharmacologic agents used in the treatment of osteoarthritis include the following:

- Paracetamol
- Non-steroidal anti-inflammatory drugs (NSAIDs)
- Muscle relaxants
- Glucocorticoids
- Sodium hyaluronate
- Opioid analgesics.

Non-pharmacologic interventions, which are the cornerstones of osteoarthritis therapy, include the following:

- Patient education
- Temperature-based modalities
- Weight loss
- Exercise
- Physical therapy
- Occupational therapy
- Unloading in certain joints (eg. knee, hip)
- Surgery.

Begin treatment with paracetamol for mild or moderate osteoarthritis pain without apparent inflammation. If the clinical response is not satisfactory, or if the clinical presentation of osteoarthritis is inflammatory, consider using non-steroidal anti-inflammatory drugs (NSAIDs).

Use the lowest effective dose or intermittent dosing if symptoms are intermittent and then try full doses if the patient’s response is insufficient. In patients with highly resistant pain, consider the analgesic tramadol. Options in patients at an elevated risk for GI toxicity due to NSAIDs include sodium hyaluronate, glucocorticoids, and paracetamol.
include the addition of a proton-pump inhibitor to the treatment regimen or use of a selective cyclo-oxygenase (COX) inhibitor instead of the non-selective NSAID. Muscle relaxants may benefit patients with evidence of muscle spasm. Judicious use of narcotics (eg, codeine; oxycodone) is reserved for patients with severe osteoarthritis.

Chondroprotective drugs (ie, matrix metalloproteinase [MMP] inhibitors, growth factors) are being tested as disease-modifying drugs in the management of osteoarthritis. Intra-articular pharmacologic therapy includes corticosteroid injection and viscosupplementation, which may provide pain relief and have an anti-inflammatory effect on the affected joint. Radiologists may aid in the treatment of osteoarthritis by administering image-guided intra-articular injections of steroids.

After the introduction of the needle into the joint and prior to steroid administration, aspiration of as much synovial fluid as possible should be attempted. This procedure often provides symptomatic relief for the patient and allows laboratory evaluation of the fluid, if necessary. Injected joint fluid and bacteraemia are contraindications to steroid injection. Steroid injections generally result in a clinically and statistically significant reduction in osteoarthritic knee pain as soon as one week after injection. The effect may last, on average, anywhere from four to eight weeks per injection, but this benefit often continues beyond that timeframe.

One randomised, placebo-controlled study confirmed the effectiveness of corticosteroid injection in the treatment of hip osteoarthritis, with benefits often lasting as long as three months. Some controversial evidence regarding frequent steroid injections and subsequent damage to cartilage (chondrodegeneration). Therefore, usually no more than three injections are recommended per year in any one osteoarthritic joint. Systemic glucocorticoids have no role in the management of osteoarthritis.

Intra-articular injection of hyaluronic acid also referred to as viscosupplementation, has been shown to be safe and effective for the symptomatic relief of knee osteoarthritis. Viscosity can help to facilitate the cushioning and lubricating characteristics of the joint during slow movements, while elasticity blunts deforming forces (compression and resistance to shear forces) during rapid motions.

Instruct the patient to avoid aggravating stress to the affected joint. Implement correction procedures if the patient illustrates poor posture. Lifestyle modification, particularly exercise and weight reduction, is a core component in the management of osteoarthritis (OA). Weight reduction relieves stress on the affected knees or hips. The benefits of weight loss, whether obtained through regular exercise and diet or surgical interventions, may extend not only to symptom relief but also to a slowing in cartilage loss in weight-bearing joints such as knees with radiographic OA.

Osteoarthritis of the knee may result in disuse atrophy of the quadriceps. Because these muscles help to protect the articular cartilage from further stress, most research into osteoarthritis of the knee focuses on quadriceps strengthening in knee osteoarthritis. Stretching exercises are also important in the treatment of osteoarthritis, because they increase range of motion.

Some patients with osteoarthritis benefit from heat and capsaicin cream placed locally over the affected joint, and a minority of patients report relief with ice.

The importance of aerobic conditioning, particularly low-impact exercises (if osteoarthritis affects weight-bearing joints), should be stressed as well. Swimming, especially aerobic aquatic programs can be helpful.

Results from a study by Wang et al suggested that tai chi is a potentially effective treatment for pain associated with osteoarthritis of the knee. In a prospective, single-blind, randomised, controlled trial, 40 patients with symptomatic tibiofemoral osteoarthritis who performed 60 minutes of tai chi twice weekly for 12 weeks experienced significantly greater pain reduction than did control subjects who underwent 12 weeks of wellness education and stretching. The mean difference in Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain scores was -118.80mm.

The tai chi cohort also had significantly better WOMAC physical function scores, patient and physician global visual analog scale scores, chair stand time, Center for Epidemiologic Studies Depression Scale scores, self-efficacy scores, and Short Form 36 physical component summaries.

In a review on patient adherence to exercise, Marks and Allegrante concluded that interventions to enhance self-efficacy, social support, and skills in the long-term monitoring of progress are necessary to foster exercise adherence in people with osteoarthritis.

The use of assistive devices for ambulation and for activities of daily living may be indicated for patients with osteoarthritis. Braces and appropriate footwear may also be of some use. A cane can be used in the opposite hand for hip osteoarthritis, and a cane in the hand of comfort may be helpful for knee osteoarthritis. The patient can be taught joint-protection and energy-conservation techniques. Other physical therapy modalities include electrotherapy and thermotherapy.

Patients who undergo arthroscopy (see below for surgical treatment options) usually require a period of crutch use and/or exercise therapy; this typically lasts days or sometimes weeks. Those patients undergoing osteotomy and fusion require partial weight-bearing exercise until bony healing occurs; afterward, exercise is indicated.

After joint replacement, patients require partial weight-bearing exercises, which progresses to full weight-bearing exercises in one to three months; range-of-motion and strengthening exercises are started within a few days after joint-replacement surgery and continued until the patient has good range of motion and strength. After resection arthroplasty of the hip, patients require instruction in the use of crutches or a walker, which are usually needed permanently.

Occupational adjustments may be necessary for some patients with osteoarthritis. Evaluation of how well the patient performs his/her activities of daily living, as well as retraining of the patient, can be assisted by an occupational therapist. Joint-protection techniques should be emphasised. Hand-splinting, especially of the first carpometacarpal joint, may be indicated.

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References on request