

Osteoarthritis

How Obesity Affects Arthritis

By Leni Ellen Kramer, MD, FACR

In the United States, osteoarthritis (OA) is the most common form of arthritis affecting about 16 million Americans. Obesity is a well established risk factor for osteoarthritis of the knee, and possibly the hip. More than 70 percent of women and 35 percent of men with OA of the knee are overweight. It is characterized by pain at the knee on beginning motion, such as arising from a chair, and increased pain with prolonged use. In the early stages of OA, the pain is relieved by rest, but as the disease progresses, the pain can persist after activity, and even interfere with sleep.

What Causes Osteoarthritis?

Also referred to as degenerative joint disease, OA results from changes in the cartilage matrix that lead to a decreased capacity to retain water. Fissures and cracks develop in the dry cartilage, leading to the exposure of subchondral bone. This leads to osteophyte formation, or the apposition of spurs of bone that impede joint motion. Increased body weight increases the joint load leading to more rapid disease progression.

Other factors may play a role in the development of OA in obese individuals, including alteration in joint biomechanics, increased leptins in the joint and alteration in pain perception. Increased levels of leptins have been found in the joint fluid of patients with OA, and are correlated with body mass index (BMI). Leptins are important in promoting the effects of nitrous oxide and other mediators of inflammation. They may be an important modulator in the cascade of events associated with OA on a cellular level (1).

Measuring Osteoarthritis

A recent study looked at the reaction to physical pain in obese people. Sixty-two patients with OA were studied and about one third of them were obese. Participants got a mild shock to the ankle to measure their pain reflex, or with-

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drawal. They then got a lesson in coping skills and were retested. All the patients had a milder reaction after the lesson, but the obese patients had a stronger pain reflex than the non-obese during both tests. However, their subjective or reported pain levels were no different than the non-obese persons. This suggests that an obese person may not experience pain at the same level as a non-obese person when a potentially damaging stimulus is occurring. This could lead to more joint destruction and pain as it progresses (2). However, pain is a subjective experience.

The WOMAC Osteoarthritis Index asks patients to rate the severity of their pain using a visual or number scale. BMI correlates positively with reported pain severity as do measures of depression, anxiety and fatigue. One cannot ignore the strong correlation between psychological factors and the perception of pain in obese persons with OA (3).

How is Osteoarthritis Treated?

Treatment of OA is largely symptomatic, aimed at reducing pain and disability. The American College of Rheumatology recommends weight-loss and exercise to reduce the painful and incapacitating effects of OA. A weight-loss of 5 percent of body weight in obese older adults brought a gain in overall function of 18 percent in a recent study. This 18 month study of obese adults with OA of the knee, ranging in age from 60 to 89 with a sedentary lifestyle, measured weight and BMI as well as scales of physical function, pain and biomechanical gait analysis. All participated in a weight-loss plan, some through diet only,

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some through exercise only and some through a combination of both. Participants lost an average of 2 percent of their weight.

There was a significant association between the weight-loss and reduction in compressive knee joint loads. The force reduction was four times greater than the actual weight reduction. In other words, for every pound lost, there is a four pound reduction in the load exerted on the knee for each step taken (4). Although there are no studies to correlate weight-loss in humans with reduction in OA disease progression, a finding of this magnitude is compelling.

Medications for Treatment

OA of the knee can be treated with local and systemic medications. Local therapies include topical and injected agents. Although a variety of topical preparations exist, the only one studied for OA is capsaicin. This product is made from hot pepper and works by tuning out the pain. Some burning is common when beginning its use. Intra-articular corticosteroid injections are helpful for OA patients, particularly if the joint has a fluid collection or if inflammation is present. Injection can provide immediate relief for those beginning treatment or experiencing a flare, as well as for those who cannot use oral anti-inflammatory medication.

Hyaluranate is a large polysaccharide molecule that is

decreased in the cartilage of OA patients. Viscosupplementation therapy consists of the injection of hyaluronate preparations into the knee joint. Three to five injections of the preparation are administered on a weekly basis. Synvisc and Hyalgan are two commonly used brands. Studies have demonstrated improvement in joint pain when compared with placebo. The injected material is viscous and adheres to cartilage, but the exact mechanism of action is unclear. The procedure can be repeated every six months, and is a good option for those with moderate disease activity.

Osteoarthritis Pain Relief

Most patients do require oral pain relievers of some kind. The American College of Rheumatology recommends beginning therapy with simple analgesics such as acetaminophen. However, there is data that suggests that non-steroidal anti-inflammatory drugs (NSAIDs) are more efficacious and preferred by patients than acetaminophen (5). There is evidence that full dose, or four grams daily, acetaminophen may not be as safe as once thought, and carries a risk of liver toxicity (6). Acetaminophen, in moderate doses of two grams or less per day, can be tried in patients with mild to moderate disease, but patients with more advanced disease are likely to require NSAIDs. NSAID therapy is effective in OA as both an anti-inflammatory and an analgesic. These drugs inhibit cyclooxygenase (COX), an important inflammatory mediator.



Helpful Tips for Improvement

Exercise helps patients with OA improve range of motion and build strength. Quadriceps strengthening exercise also helps patients with OA of the knee improve stability. High

impact activities such as running can accelerate the disease. Low impact and aquatic exercise classes, such as those sponsored by the Arthritis Foundation, can be most helpful.

Those who feel too self-conscious to attend a class can exercise carefully on their own. One easy way is with an aquatic belt, available in sporting goods

stores. The belt is not a life preserver, but allows the user to “walk” in the water, barely touching the pool floor. Muscles are strengthened during this aerobic activity, with a reduced gravitational stress on weight bearing joints.

Other ways of improving performance without medication include balancing rest and activity and using assistive devices, such as canes or walkers. Bracing the knee is also useful. Newer designs are light and less conspicuous, while unloading a great deal of the weight on the joint. They can be customized to any size, and although these are costly, they are covered under Medicare with a doctor’s prescription.

While effective, all NSAIDs have associated risk factors, such as gastrointestinal (GI) bleeding and gastritis, as well as edema, hypertension and cardiac effects. The gastrointestinal effects occur less often with COX-2 selective agents such as Celebrex. The use of acid reducers or cytoprotective agents can further reduce the risk of GI complications.

Those with a history of cardiac disease, hypertension, or elevated cholesterol are at increased risk for cardiac complications of NSAIDs, and need to discuss the benefits versus the risks with their physicians. Many obese patients will fall into the high risk category. Patients with renal disease and those using anticoagulants may not be able to use NSAIDs.

Alternative analgesics include tramadol and narcotics. Although not technically a narcotic, Tramadol has narcotic-like action and effect. It is useful for mild to moderate pain, and can reduce the dose requirement for NSAID. It is well tolerated, but the dose must be increased gradually to avoid dizziness and nausea. Narcotic analgesics can be used in patients with severe or advanced OA that failed to respond to traditional agents. Contrary to popular belief, there is no risk of addiction when these agents are used as directed to relieve pain.

Other Forms of Pain Management

Muscle relaxants can improve pain caused by the muscle spasm that often occurs at arthritic joints and in the back. Anti-depressants, which work by increasing brain serotonin levels, are effective in reducing pain perception. The use of sedatives to improve sleep is also important. These agents are well tolerated additions to OA therapy. Glucosamine and chondroitin sulfate have been widely promoted to “reduce joint pain and support healthy cartilage.”

The recently published Glucosamine/Chondroitin Arthritis Intervention Trial (GAIT) compared these products to placebo and to Celebrex. The combination was shown to be effective in moderate to severe pain, but not in mild to moderate pain, and the response to placebo was high (7). I tell my patients to try it and to continue if they find it useful.

Knee Replacement

Total knee replacement is a very successful treatment for advanced OA of the knee. Although a poorer outcome for obese patients has been suggested, a five year study showed no difference in the range of motion or



For More Information...

For more information on osteoarthritis and the locations of physicians and approved exercise programs in your area, contact your local chapter of the Arthritis Foundation by visiting www.arthritis.org.

the need for surgical revision between a group of morbidly obese persons and control patients. However, the rate of preoperative complication was higher, particularly related to poor wound healing and infection (8).

Most surgeons do not advocate weight-loss prior to knee replacement, as the nutritional compromise could slow healing further. The obese patient considering knee replacement needs to seek an experienced surgeon, understand the expectations and the need for careful wound care.

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ABOUT THE OBESITY ACTION COALITION (OAC)

The Obesity Action Coalition (OAC) is a National non-profit organization dedicated to giving a voice to individuals affected by obesity and helping them along their journey toward better health. Our core focuses are to elevate the conversation of weight and its impact on health, improve access to obesity care, provide science-based education on obesity and its treatments, and fight to eliminate weight bias and discrimination.



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The OAC knows that the journey with weight can be challenging but we also know that great things happen when we learn, connect and engage. That is why the OAC Community exists. Our Community is designed to provide quality education, ongoing support programs, an opportunity to connect, and a place to take action on important issues.

Through the OAC Community, you can get access to:

- Weight & Health Education • Community Blogs
 - Community Discussion Forum
 - Ongoing Support • Meaningful Connections
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