The Role of Hyaluronic in Osteo Arthitis (Regeneration of Genu's articulation)

by Tri Wahyuliati

The Role of Hyaluronic Acid in Articulatio Degeneration

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Abstract

Joints are like gears. They work best if they're well lubricated. In a healthy joint, a thick substance called synovial fluid provides lubrication, allowing bones to glide against one another. Synovial fluid acts as a shock absorber, too. In people with osteoarthritis, a critical substance in synovial fluid known as hyaluronic acid breaks down. Loss of hyaluronic acid appears to contribute to joint pain and stiffness.

Osteoarthritis of the knee is one of the leading causes of disability in the world. It develops slowly and the pain it causes worsens over time. Although there is no cure for osteoarthritis, there are many treatment options available to help people manage pain and stay active, including : Changes in activity level, Weight loss, Pain relievers : acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), Physical therapy, Corticosteroid injections

Another treatment option is a procedure called viscosupplementation. In this procedure, a gel-like fluid called hyaluronic acid is injected into the knee joint. Hyaluronic acid is a naturally occurring substance found in the synovial fluid surrounding joints. It acts as a lubricant to enable bones to move smoothly over each other and as a shock absorber for joint loads. People with osteoarthritis have a lower-than-normal concentration of hyaluronic acid in their joints. The theory is that adding hyaluronic acid to the arthritic joint will facilitate movement and reduce pain.

Key word : hyaluronic acid, injection, osteoarthritis, efficacy.

Introduction

Osteoarthritis is responsible for a large burden of care and cost within health care. Osteoarthritis results from an imbalance between the breakdown and repair of articular cartilage in any joint and occurs as a result of multiple risk factors including mechanical overload (obesity, heavy lifting), trauma, overuse (repetitive knee bending), and genetic predisposition. The CDC (U.S. Centers for Disease Control and Prevention) reports that one in two individuals may develop symptoms of osteoarthritis in at least one knee by eighty-five years of age. The incidence of new knee osteoarthritis in the U.S. is estimated at 240 persons per 100,000 per year. The prevalence of the condition increases with age, especially in women. In adults over fifty years of age, it is estimated that the incidence of knee osteoarthritis in women is 45% higher than in men. The prevalence of symptomatic knee osteoarthritis in patients at least forty-five years of age has been estimated to be 5.9% to 13.5% in men and 7.2% to 18.7% in women. Physician visits for knee pain in patients over the age of sixty-one years in the U.S. increased from 4.48

million in 2002 to 6.11 million in 2006. The economic impact of the treatment of osteoarthritis in the U.S. was estimated to be $185.5 billion in a 2009 study, with a large portion of those dollars being spent for knee osteoarthritis.

Hyaluronic acid to treat osteoarthritis was originally proposed 70 years ago by Hungarian scientist Endre A. Balasz. By 1987, hyaluronic acid treatments were being used overseas. Hyaluronic acid injections are one treatment option when a patient is no longer able to control osteoarthritis pain with ibuprofen or other nonsteroidal anti-inflammatory drugs (NSAIDs), or the patient can't tolerate these drugs (which can cause side effects such as stomach bleeding and kidney problems). The treatment regimen for hyaluronic acid usually involves receiving one injection in the affected joint per week for three to five weeks. Many patients appear to get at least some relief – eventually.

In 2006, a team led by Nicholas Bellamy, MD, of the University of Queensland in Brisbane, Australia, reviewed 76 studies examining the use of hyaluronic acid for treating knee osteoarthritis. The review, the largest and most comprehensive of its kind, found that pain levels in the average patient who receives these injections are reduced by 28 to 54 percent. That's roughly what a patient might expect from taking NSAIDs, the authors concluded. Meanwhile, hyaluronic acid improved the ability to move about and perform daily activities by 9 to 32 percent.

Mechanism of Action

Synovial fluid acts as a shock absorber. Normally, a fluid called hyaluronan lubricates joints. In people with of osteoarthritis, the supply of hyaluronan has thinned. A critical substance in synovial fluid known as hyaluronic acid breaks down. Loss of hyaluronic acid appears to contribute to joint pain and stiffness. Hyaluronic acid injections (also known as viscosupplements) are approved for treating osteoarthritis of the knee, though some doctors have used the therapy on other joints, such as the hip and ankle. People with arthritis get these shots to help lubricate their joints so that they work more smoothly.

Studies of hyaluronic acid injections have occasionally yielded disappointing results, many doctors who treat osteoarthritis say that the weight of scientific evidence – and their own clinical experience – suggests that a shot in the knee can produce significant relief for some patients. Furthermore, lab and clinical research hints that hyaluronic acid may do much more

than simply re-grease a creaky joint. Some evidence systematic reviews assessing the clinical significance of outcomes involving pain relief and functional improvement does not support the routine use of intra-articular HA.

Procedure

The procedure is simple. Injection hyaluronic acid directly into the area around the knee joint. Most people get a shot a week for 3 to 5 weeks. The FDA has only approved this treatment for people with osteoarthritis of the knee, but some people get it in other joints as well. Depending on the product used, one to five shots will be used over several weeks. During the procedure, if there is any swelling in your knee, doctor will remove (aspirate) the excess fluids before injecting the hyaluronic acid. Usually, the aspiration and the injection are done using only one needle injected into the joint, some doctors may prefer to use two separate syringes. For the first 48 hours after the shot, you should avoid excessive weight bearing on the leg, such as standing for long periods, jogging or heavy lifting.

Side Effects and Complications

Some side effects are a local reaction, such as pain, warmth, and slight swelling immediately after the shot. These symptoms generally do not last long. You may want to apply an ice pack to help ease them. Rarely, patients may develop a local allergy-like reaction in the knee. In these cases, the knee may become full of fluid, red, warm, and painful. If this occurs, contact your doctor immediately. Infection and bleeding are also very rare complications of this procedure.

Outcome

Some patients will not be helped by viscosupplementation. For those who report pain relief with the procedure, it may take several weeks to notice an improvement. How long the effects last varies. Some patients report pain relieving effects for several months following the injections. If the injections are effective they may be repeated after a period of time, usually 6 months. Although some patients report relief of arthritis symptoms with viscosupplementation, the procedure has never been shown to reverse the arthritic process or re-grow cartilage. It has

been proposed that viscosupplementation is most effective if the arthritis is in its early stages (mild to moderate)

As a patient soon learns, though, hyaluronic acid is no quick fix. According to Bellamy's review (which was conducted on behalf of the Cochrane Collaboration, an international consortium that reviews scientific evidence for medical treatments), it takes about five weeks, on average, before a patient experiences the full benefits of hyaluronic acid. By contrast, corticosteroid injections – the other primary treatment choice when NSAIDs aren't an option – provide significant relief within a few days. However, pain relief from corticosteroids diminishes markedly within a month or so. What's more, overuse of corticosteroids can have a catabolic effect – that is, it could cause cartilage to break down and deteriorate further, explains Case Western Reserve University rheumatologist Roland W. Moskowitz, MD. Meanwhile, the Cochrane review found that pain-relieving benefits of hyaluronic acid persist at peak levels for about three months, on average. Dr. Moskowitz sometimes gives patients a double shot in the knee – one injection each of hyaluronic acid and corticosteroids – for quick-acting, long-lasting relief.

Large studies like the Cochrane review reflect how the average individual responds to a therapy; as the old saying goes, your results may vary. About 30 percent of people who undergo hyaluronic acid injections become virtually pain free, and symptom relief may last up to two years, says UCLA rheumatologist Roy D. Altman, MD. Yet, another 20 percent of patients experience no benefit. Unfortunately, adds Dr. Altman, "we don't know how to pick out those people who are going to have an outstanding response versus a modest response versus no response at all. He and his colleagues have tried to identify ways to predict how a patient will respond to hyaluronic acid, but so far have come up empty.

Conclusion

Studies indicate that injecting supplemental hyaluronic acid may coax the joint into increasing its own production of this important substance, which may in turn help to preserve cartilage. There's a lot of data to suggest that it can slow the disease down. Hyaluronic acid is not a magic pill, but it has a definite role in the armamentarium for treating osteoarthritis of the knee.

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