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Is a Whole Food, Plant-Based Diet the Most Effective Treatment of Arthritis?

Elisheva Liberman

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Abstract

Arthritis is a debilitating disease where joint inflammation occurs. There are different types of arthritis, such as Osteoarthritis and Rheumatoid Arthritis. Osteoarthritis is the destruction of the articular cartilage that usually comes with age, whereas Rheumatoid Arthritis is a chronic autoimmune disease. They both have symptoms which include reduced range of motion, pain and swelling. There are various treatments to alleviate the pain and reduce the inflammation of arthritis. Among them are medication, physical therapy, surgery and a whole food, plant-based diet. The whole food, plant-based diet yields the best results and is the most effective and practical.

Introduction

Arthritis is a disease characterized by joint inflammation that causes discomfort and eventually intense pain along with stiffness of the joints. Other symptoms include reduced range of motion, muscle weakness, redness, and swelling. These symptoms can come and go at different intensities. Arthritis is also characterized as a musculoskeletal disorder (Carter & Rizzo 2007). Arthritis is twice as common in women than in men; however, men and children of all ages can experience it as well (Lourdudoss et al. 2018). Though there are various kinds of treatments that can alleviate the pain of arthritis, many say that arthritis cannot be cured. It is a chronic disease that causes pain, but that one can live a lifetime with. Between the years 2013 and 2015, approximately 54.4 million adults had arthritis, of which 23.7 million adults were limited in activity. Arthritis affects approximately a sixth of the American population today and is predicted "to affect 78.4 million people by 2040" (Barbour et al. 2017) (Juyoung et al. 2018).

There are many types of arthritis, some that occur in many joints at once or other types that are isolated in one joint. Arthritis can be found in the ankles, fingers, wrists, back, jaw, and neck. Different causes give rise to different types of arthritis. Osteoarthritis and Rheumatoid Arthritis are two of the most common types. The most rampant musculoskeletal disease amongst the elderly is Osteoarthritis (Hinman et al. 2007).

Osteoarthritis

Osteoarthritis is when the articular cartilage begins to wither away and eventually disintegrates. The articular cartilage allows for painless joint movement through load distribution and reduces friction between the bones. In Osteoarthritis, the bones rub against each other which can cause extreme pain. For example, a person with Osteoarthritis of the knee will have difficulty walking and climbing the stairs. Researchers believe that the cartilage destruction has a chemical and mechanical cause; however, the direct mechanism is unknown. Mechanical factors that can increase the risk of Osteoarthritis are obesity, heavy lifting, abnormal loading of joints from trauma, and joint instability (Beasley 2012). Osteoarthritis is asymmetrical, meaning that if one experiences pain in a joint on one side of the body, this does not mean that they experience it in the same joint on the other side. The pain is most intense in the

evening and night hours and is a cool pain rather than hot. Along with Osteoarthritis comes crepitus which is a grinding, clicking, or popping movement of the joint accompanied by a sound (Witulski et al. 2014). Osteoarthritis is most commonly found in elderly people, due to the wear and tear of many years of living. It has a relatively slow onset that worsens with age (Azumasa & Misako 2017).

Rheumatoid Arthritis

Rheumatoid Arthritis is different in that it's a chronic autoimmune disease. The body attacks itself causing inflammation of the joints, which overtime erodes the bones. Normally, joints have synovial fluid which provides lubrication. In Rheumatoid Arthritis the synovial fluid becomes less viscous, causing further cartilage damage because of the reduced joint lubrication (Beasley 2012). In contrast to Osteoarthritis, Rheumatoid Arthritis most often occurs symmetrically, meaning that if one has arthritis in the left shoulder, they usually also have it in the right shoulder as well. Further, the sites of Rheumatoid Arthritis are warm, and sufferers experience the most pain during the morning hours. The flare ups of Rheumatoid Arthritis are random unlike the constant pain of Osteoarthritis. The symptoms of Rheumatoid Arthritis can get better, only to worsen again. Rheumatoid arthritis can be found in people of all different ages.

Methods

The Touro College Online Library allowed access to Ebsco and Proquest which were the two databases used to find the proper scholarly articles needed. Analysis of these studies helped develop the answer to whether or not a whole food, plant-based diet is the most effective treatment of arthritis.

Discussion Treatments of Arthritis

Popular treatments of arthritis include medication, physical therapy and sometimes surgery. Another less popular but interesting approach is a whole food, plant-based diet. Studies have shown that a whole food, plant-based diet can alleviate the pain and possibly cure arthritis. This paper will try to answer the question: is a whole food, plant-based diet actually the most effective treatment of arthritis?

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Medication

Although various medications are anti-rheumatic, they come along with many possible negative side effects as well. Names of different arthritis medications are Leflunomide, Sulfasalazine, Methotrexate, Etanercept, Adalimumab, Anakinra, Canakinumab, Abatacept, Infliximab, Rituximab, and Tocilizumab. Leflunomide and Sulfasalazine can be taken orally. Methotrexate can be taken orally or given as an injection. Etanercept, Adalimumab, Anakinra, and Canakinumab all only come in an injection form. Abatacept, Infliximab, Rituximab, and Tocilizumab can only be given intravenously. Some of the common side effects are included below (Table 1). While medication may alleviate the pain of arthritis, the patient may have to deal with other annoying and sometimes painful side effects (Brinkman et al. 2017).

Another downside of taking medication is the cost, which can be very high without insurance. For example, Etanercept costs around one thousand dollars per weekly injection (Brinkman et al. 2017).

Common Medications Used to Treat Arthritis and Their Side Effects

Medication	Common Side Effects
Leflunomide	Headache, diarrhea, upset stomach, cold symptoms
Sulfasalazine	Headache, diarrhea, upset stomach, cold symptoms
Methotrexate	Headache, upset stomach, mouth sores, nausea
Etanercept	Headache, upset stomach, sinus infection, common cold, itchy or allergic rash, redness or soreness where needle enters skin
Anakinra	Headache, upset stomach, sinus infection, common cold, itchy or allergic rash, redness or soreness where needle enters skin
Adalimumab	Headache, upset stomach, sinus infection, common cold, itchy or allergic rash, redness or soreness where needle enters skin
Canakinumab	Headache, upset stomach, sinus infection, common cold, itchy or allergic rash, redness or soreness where needle enters skin
Abatacept	Headache, upset stomach, common cold, sinus or throat infection
Rituximab	Headache, upset stomach, common cold, sinus or throat infection
Infliximab	Headache, upset stomach, common cold, sinus or throat infection
Tocilizumab	Headache, upset stomach, common cold, sinus or throat infection

Table 1. Medications retrieved from www.cincinnatichildrens.org Arthritis Medication Choice Cards

Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)

These drugs are preferred to treat arthritis over acetaminophen,

aspirin and mild opiates. Many people often take aspirin for arthritic pain and although it mitigates the pain, they get gastrointestinal toxicity from it. This gastrointestinal toxicity inhibits NSAIDs and thus the preferred medical treatment cannot be used (Lisse et al. 2003).

Disease Modifying Anti Rheumatic Drug

Another approach to healing Rheumatoid Arthritis is a modern type of drug known as a disease modifying anti rheumatic drug. This type of drug suppresses the immune system to inhibit the body from attacking itself and causing joint inflammation. It was designed to get rid of pain and tenderness of the joints and improve joint function long term. Yet, this was true for only 10-50% of patients treated with this drug. Many Rheumatoid Arthritis patients still suffer intense pain (Winkvist et al. 2018). Because of this result, disease modifying anti rheumatic drugs do not sound promising.

Physical Therapy

A study was done where the physical therapists did exercises with the arthritis patients. At the end of the treatment period they saw improvement in grip strength. Physical activity improved the functional status of arthritis patients. Some therapists use a paraffin wax bath for distal joints to reduce pain. The moist heat of the wax soothes the joints and makes the exercise of physical therapy less painful (Shinde & Varadharajulu 2017).

This study is not an accurate assessment of a good treatment for arthritis. The study was flawed in that their subjects ranged from ages twenty to fifty-five. While the physical activity may improve the symptoms of younger and middle-aged people, it probably would not have the same effect on the elderly. Elderly bodies are often fragile and worn out. It is harder for old people to recover from diseases. This study does not effectively prove that physical therapy is the most effective treatment for arthritis across the board.

Hydrotherapy

In addition to traditional physical therapy, hydrotherapy, physical therapy done in an aquatic environment, is another treatment for arthritis. During hydrotherapy, physical therapists treat patients through exercises in heated pools. There are multiple benefits of hydrotherapy that standard physical therapy does not have. Firstly, "buoyancy reduces loading across joints affected by pain and allows the performance of functional closed-chain exercises that otherwise may be too difficult on land." Another benefit is that the water movement and pressure can be used as resistance which makes the exercises more effective. Furthermore, pain relief, swelling reduction, and ease of movement increase due to the warmth and pressure of the water. The warm water leads to muscle relaxation, enhancing movement (Hinman et al. 2007).

Electrotherapy

Electrotherapy is another effective form of physical therapy: “Electrotherapy consists of the application of electrotherapeutic procedures (ionization and ultrasound) to the affected regions, with an analgesic, anti-inflammatory and decontracturing indication” (Tosa et al. 2016). It uses electrical energy as a medical treatment and reduces inflammation and decreases pain. Electrotherapy is amongst the most frequently used physical therapy treatments of Rheumatoid Arthritis.

Analysis of Physical Therapy

Different kinds of physical therapy can be helpful in treating arthritis; however, physical therapy is often not so practical. Physical therapy is costly and Medicare may limit access or coverage of services like these. Thus, elderly patients with arthritis are less likely to receive physical therapy (Carter & Rizzo 2007).

Hydrotherapy is costly and pools are not always accessible in every community. Hence, hydrotherapy is not available for all arthritic patients. Additionally, although hydrotherapy somewhat reduced the pain in Osteoarthritis patients, studies have shown that after six weeks of treatment the pain relief was minimal. Hydrotherapy only reduced pain, stiffness and hip strength slightly. Therefore, it appears that hydrotherapy is not the most effective treatment of arthritis (Hinman et al. 2007).

Joint Replacement Surgery

Joint replacement is another approach to healing arthritis, yet this option is a last resort for most people. People get joint replacements once the articular cartilage is almost completely destroyed and they are in a debilitating state. A preventative cure is more preferred (Clinton et al. 2015).

Whole Food, Plant-Based Diet

Whereas all the treatments mentioned thus far were costly, an effective approach called the whole food, plant-based diet is inexpensive. Besides for being affordable, this method of treating arthritis is also doable, practical, and easy. Anyone can do it; it does not require higher education. A study was done where patients with arthritis kept a whole food, plant-based diet and eliminated meat and dairy foods for six weeks. Researchers observed that the patients' Rheumatoid Arthritis symptoms decreased while the patients were off of meats and dairies. The whole food, plant-based diet has been shown to improve the pain and other symptoms of Osteoarthritis patients as well. After only the first two weeks of this six-week study researchers saw clinical results. This demonstrates the diet's effectiveness in lessening the pain, and the pain got less and less as time went on. After being on a whole food, plant-based diet, people had increased levels of alpha and beta carotene, lycopene, lutein, vitamin C and vitamin E in their sera. These are all beneficial and healthy antioxidants or vitamins. According to the USDA

pyramid, a human should ingest solid and liquid animal protein daily, such as meats and dairies. This is not in accordance with the whole food, plant-based diet (Clinton et al. 2015).

Arachidonic Acids and Omega-3 Fatty Acids

Arachidonic acids are precursors to proinflammatory eicosanoids and prostaglandins and are found in cell phospholipids. Prostaglandins are hormones that are created during chemical reactions due to an injury or disease and they can increase inflammation. An eicosanoid is a signaling molecule that can increase inflammation as well. More than 80% of ingested arachidonic acids are used to produce eicosanoids (Adam et al. 2003). Animal products are high in arachidonic acids whereas a whole food, plant-based diet is low in arachidonic acids. By keeping to a diet low in arachidonic acids, inflammation in patients with Rheumatoid Arthritis can decrease (Clinton et al. 2015).

Studies show that Omega-3 fatty acids reduce arthritic pain. Omega-3 fatty acids from fish oil stop the formation of cytokines and eicosanoids. This is because they compete with the Omega-6 fatty acids for a spot in the cell phospholipids and for the binding sites of cyclooxygenase and lipoxygenase. Since the eicosanoids cause inflammation, eating Omega-3 fatty acids reduces inflammation, reducing arthritic pain (Adam et al. 2003).

In a study, Omega-3 fatty acid levels were highest in the serum of whole food, plant-based dieters. Omnivores and fish eaters had less Omega-3 fatty acids. Alpha-linoleic acid is found in legumes, vegetables and soy. When alpha-linoleic acid is metabolized, it produces anti-inflammatory prostaglandins. These anti-inflammatory prostaglandins help reduce arthritic symptoms (Clinton et al. 2015).

There was a study done over the span of eight months, in which the subjects were divided into two groups. One group was put on an anti-inflammatory diet and the other on a western diet. There was a positive correlation between arachidonic acid consumption and the percent of arachidonic acids in erythrocyte lipids. Those on an anti-inflammatory diet (AID), where they ate a minimal amount of animal products, had a lower percent of arachidonic acids in their blood than those on a western diet (VD) (Adam et al. 2003).

Populations with high fish consumption include the Alaskan Natives, Greenland Eskimos, and Japanese living in villages where fishing is constant (Zheng et al. 2012). In these areas, the percent of arachidonic acids in plasma phospholipids was approximately 2%, whereas in industrialized countries it was approximately 16% (Adam et al. 2003). Rheumatoid Arthritis is not nearly as prevalent in populations with high fish consumption as it is in industrialized countries due to the Omega-3 fatty acids in fish.

In the eight-month study mentioned above, in addition to the diet they were instructed to follow, some subjects in each group received placebo or verum pills and some fish oil capsules.

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Those in the anti-inflammatory diet group who received the placebo had a 14% decrease in tender and swollen joints collectively. Those in the anti-inflammatory diet group who received fish oil had a 28% decrease in tender joints and a 34% decrease in swollen joints. Those in the western diet group who received fish oil had an 11% decrease in tender joints and a 22% decrease in swollen joints. Overall, the anti-inflammatory diet with a fish oil capsule decreased the tenderness and swelling of joints more than the western diet with a fish oil capsule. It is also clear that the fish oil which is rich in Omega-3, had an effect and decreased the tenderness and swelling of the joints more than the placebo did (Adam et al. 2003).

Two different capsules were administered to patients that were not real fish oil. The placebo was corn oil and the verum was menhaden oil. Even without fish oil, which has a greater effect than the other oils, the anti-inflammatory diet is significantly more effective in reducing symptoms of arthritis than the western diet is. This is a good study, adequately proving how a diet low in arachidonic acids and including fish oil supplements can greatly alleviate pain, improve arthritic symptoms and reduce production of eicosanoids and cytokines (Adam et al. 2003).

Another study compared two groups. One group kept to an ordinary, omnivorous diet, while the other kept to a whole food, plant-based diet. The results were that the whole food, plant-based diet caused the swelling of the joints to decrease, less pain and increased functional status. Compared to the omnivorous diet, the whole food, plant-based diet was more effective in pain reduction (Clinton et al. 2015).

As an added bonus, a whole food, plant-based diet can result in weight loss and blood pressure reduction (Silberman et al. 2010). Excess weight can add abnormal mechanical stress on the knee joint; obesity makes arthritis worse (Cianflocco 2011). As a result of weight loss, the mechanical load on arthritic joints decreases, alleviating the pain caused by arthritis (Messier et al. 2005). Knee Osteoarthritis symptoms can greatly improve even from small weight losses (Bartlett et al. 2004). For someone with arthritis in the knee, "for every pound of weight lost, there is a four-pound reduction in mechanical load exerted on the knee during daily activities" (Clinton et al. 2015).

Due to articular cartilage disintegration there is a loss of space between the femur and tibia in this Osteoarthritis patient. The bone rubbing against bone can cause extreme pain to this patient. The more weight the patient has to carry around on that knee, the more the bones will rub and the more pain there will be (Cianflocco 2011). For this reason, it is worth attempting to lose weight through a whole food, plant-based diet.

It is a common misconception that a diet without animal protein causes malnutrition. A whole food, plant-based diet provides enough protein, fats, vitamins, minerals and calories (Clinton et al. 2015).

Conclusion

After analyzing the different treatment options to alleviate the pain of and possibly cure arthritis, it is apparent that the whole food, plant-based diet has the most promising results. One on this diet must not eat any animal proteins in order to maintain a low level of arachidonic acids to prevent or reduce inflammation. Along with this diet, dieters should take fish oil capsules for better results. Fish oil contains Omega-3 fatty acids which further reduce inflammation and prove beneficial to those with arthritis.

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