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Research On Sesame Seed And Flax Seeds For Rheumatoid Arthritis

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Abstract: Rheumatoid arthritis (RA) is a systemic autoimmune disease characterized by inflammatory arthritis and extra-articular involvement. It is a chronic inflammatory disorder caused in many cases by the interaction between genes and environmental factors, including tobacco, that primarily involves synovial joints. It typically starts in small peripheral joints, is usually symmetric, and progresses to involve proximal joints if left untreated.

Rheumatoid arthritis most often starts in the small joint of hands and feet. It usually affects the same joints on both sides of the body. Sesame seed and flax seeds of seeds of compound that many help in rheumatoid arthritis. Sesame seeds contain sesamol, sesamin, vitamin E, omega-6 fatty acid which many helps protect against joint damage and inflammation.

Flax seeds have antioxidant properties and its give anti-Inflammatory effects.

KAYWORD: sesame seed, flax seed, ascorbic acid, rheumatoid arthritis.

Introduction

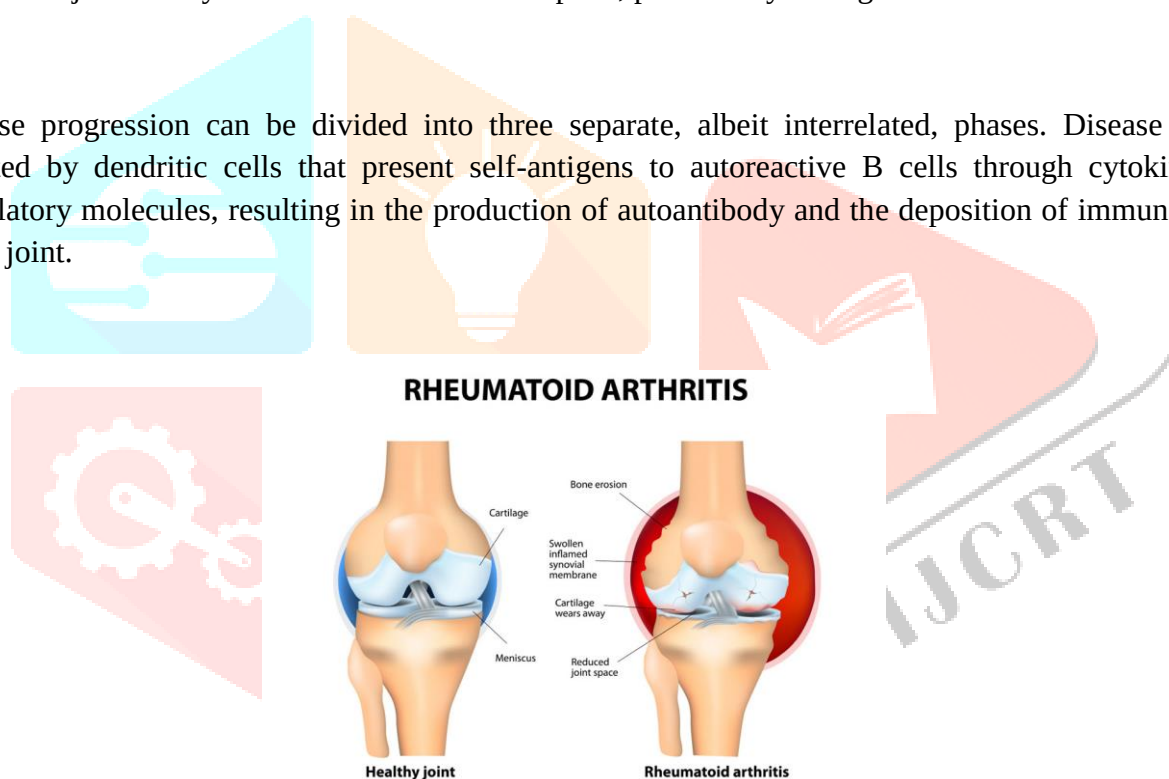
Rheumatoid arthritis (RA) is a systemic autoimmune disease characterized by inflammatory arthritis and extra-articular involvement. It is a chronic inflammatory disorder caused in many cases by the interaction between genes and environmental factors, including tobacco, that primarily involves synovial joints. It typically starts in small peripheral joints, is usually symmetric, and progresses to involve proximal joints if left untreated. Joint inflammation over time leads to the destruction of the joint with loss of cartilage and bone erosions. RA with a symptom duration of fewer than six months is defined as early RA, and when the symptoms have been present for more than six months, it is defined as established RA. RA, if untreated, is a progressive disease with morbidity and increased mortality.

Physiology of rheumatoid arthritis

Rheumatoid arthritis (RA) is a chronic symmetric polyarticular joint disease that primarily affects the small joints of the hands and feet. The inflammatory process is characterized by infiltration of inflammatory cells into the joints, leading to proliferation of synoviocytes and destruction of cartilage and bone. This is a chronic, debilitating autoimmune disease of unknown etiology affecting diarthrodial joints. Although the disease is characterized by synovitis of the joints, tendon sheaths, and bursae, manifestations that do not involve the synovium are also frequent.

These articular and systemic manifestations are mediated by hyperplasia of the synovial lining cells and extensive infiltration of macrophages, lymphocytes, fibroblasts, and leukocytes in joints, where a variety of cytokines, prostaglandins, and proteolytic enzymes are responsible for the process of the inflammation. The hallmarks of the synovial abnormalities in RA are synovial lining cell proliferation, neoangiogenesis, and inflammatory cell infiltration involving the myeloid, macrophage, and lymphoid lineages. In addition, the fluid-filled joint cavity contains numerous neutrophils, particularly during acute flares of RA.

Disease progression can be divided into three separate, albeit interrelated, phases. Disease is probably initiated by dendritic cells that present self-antigens to autoreactive B cells through cytokines and co-stimulatory molecules, resulting in the production of autoantibody and the deposition of immune complexes in the joint.



Sesame (*Sesamion indicum* L.) is one of the earliest human production and consumption oil crops in the family of Pedaliaceae, rape, soybean, and peanuts, known as China's four major oil crops. First discovered in ancient sites in Pakistan, sesame is a long-established cultivated crop. It is distributed in countries such as India, China, and Malaysia.

Sesame is widely grown and popular because of its highly aromatic odor and mellow flavor. In people's lives, sesame seeds are often used to make a variety of foods, such as sesame oil, sesame paste, or to decorate other foods.

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Nutritional Components

Sesame seeds are rich in fat, protein, minerals, vitamins, and dietary fiber. Sesame oil, which is obtained through traditional oil production methods, is rich in unsaturated fatty acids, fat-soluble vitamins, amino acids, etc. Studies have found that sesame seeds contain 21.9% protein and 61.7% fat, and are rich in minerals such as Fe and Ca. Sesame seeds are rich in nutrients and have the reputation of being an "all-purpose nutrient bank" and the "crown of eight grains".

Lipids

The lipids in sesame are mainly found in the seeds and are an important component of sesame. Sesame has the highest oil content among the major oil crops, up to 45-57%, which is why it has been known as the "Queen of Oil" since ancient times. Sesame oil is reported to contain 80% unsaturated fatty acids and a small amount of saturated fatty acids.

Linoleic acid and linolenic acid are unsaturated fatty acids, which are essential fatty acids, but cannot be synthesized in the body and therefore must be obtained through diet.

Vitamins

Vitamins also occupy a certain proportion in the nutrient composition of sesame, of which vitamin E is the richest in sesame. In particular, vitamin E can be present in black sesame seeds at levels up to 50.4 mg/100 g.

Vitamin A, thiamine, riboflavin, niacin, pantothenic acid, folic acid, ascorbic acid, α -tocopherol, γ -tocopherol, 7-tocopherol, δ -tocopherol, and tocotrienol, all the twelve vitamins have been reported to be isolated from sesame seeds.

Antinutrients

Antinutrients are substances that disrupt or prevent the digestion and absorption of nutrients, negatively affecting the health and growth of animals. The main antinutritional factors in sesame seeds are oxalic and phytic acids.

Phytochemistry

In addition to being rich in nutrients, sesame also contains many important functional components such as sesamin, sesamol, sesaminol, sesamol phenol, and other lignan-like active ingredients. The content of each component in sesame varies depending on the extraction method and external growing conditions, e.g., hot-pressed sesame oil has a higher content of sesamol, sesamin, and total lignans than cold-pressed and refined sesame oil.

The lignan content in sesame can be affected by factors such as strain, genotype, growing location (soil and weather), and growing conditions (irrigation, fertilization, and harvest time).

A variety of phytochemical compounds have been identified and isolated from sesame seeds, seed oils, and various plant organs, including lignans, polyphenols, phytosterols, phenols, aldehydes, anthraquinones, naphthoquinones, triterpenoids, and other organic compounds. Among them, the lignan components isolated from sesame

Lignans

Sesame lignans are the main active ingredients in sesame seeds and have strong antioxidant activity. Epidemiological studies have shown that sesame lignans have beneficial effects in regulating blood lipids and improving liver function. These properties are also responsible for the oxidative stability of sesame oil. Sesamin represents about 50% of the sesame lignans, with sesamol, and sesaminol accounting for a small proportion of the weight. The mean levels are 2.48 mg/g.

Sesamin

Sesamin is one of the most abundant lignans in the composition of sesame seeds and has good physiological activity. Studies have found that sesamin has good antioxidant properties, cholesterol lowering, lipid metabolism regulation, blood pressure stabilization, and anti-tumor effects. Sesamin is metabolized in the body mainly by the action of cytochrome P-450. The metabolites of sesamin exist in body fluids and tissues mainly as glucosinolates and sulfate-conjugated forms, the excretion of sesamin is via bile, urine and feces, and the elimination of sesamin is mainly achieved by metabolism.

Sesamolin

Sesamolin is the second most abundant lignan in sesame. Since sesamolin does not contain phenolic hydroxyl groups, its antioxidant effect in the body is much weaker than that of sesamol. However, under certain heating conditions, sesamolin can gradually convert to sesamol. Taking advantage of this conversion feature, the addition of sesamolin enhances the antioxidant properties of oils and fats under heating conditions.

Sesamol

Sesamol is present in low levels in sesame lignin, but it is the main flavor component and quality stabilizer of sesame oil, with good antibacterial and antioxidant properties. Studies have shown that sesamol is stable under sunlight conditions and can be used simultaneously with food additives containing Zn^{2+} and Mg^{2+} , but not with strong oxidants

MOA of sesamol

Inhibition of pro-inflammatory cytokines:

sesamol may suppress the production of pro-inflammatory cytokines, such as TNF-alpha and IL-1beta, which contribute to arthritis progression.

Inhibition of inflammatory enzymes: sesamol may inhibit enzymes involved in inflammation, such as COX-2.

Modulation of immune response: sesamol may modulate the immune response, reducing inflammation and joint damage.

Sesaminol

Sesaminol is an important fat-soluble lignan. It is found at low level in sesame seeds but demonstrates good antioxidant properties and thermal stability. Under acidic conditions, sesamolin can be readily converted to sesaminol

Anti-inflammatory Effect

Studies have shown that sesamin has anti-inflammatory effects. TNF-a is known to play an important role in the formation of rheumatoid arthritis. Khansai et al., found that sesamin significantly reduced the mRNA expression of IL -6 and IL-1 in human primary synovial fibroblast cell lines, indicating that sesamin inhibited TNF-a-induced pro inflammatory cytokine mRNA expression.

Sesamin catechol conjugates are thought to be the major metabolites of sesamin present in human plasma following oral administration of sesamin. Catechol glucuronides exert anti-inflammatory effects through demyelination in macrophage-like J774.1 cells, thereby inhibiting the expression of interferon beta and inducible nitric oxide synthase. It was found that SC1, one of the sesamin metabolites of CYP450, had stronger anti-inflammatory activity than sesamin itself in murine macrophage cell.

Flax seeds have been studied for their potential anti-arthritis effects, and the research suggests that they help alleviate arthritis symptoms in several ways:

Anti-inflammatory effects

1. Omega-3 fatty acids: flaxseeds are rich in

alpha-linolenic acid (ALA), a type of omega-3 fatty acid. ALA has anti-inflammatory properties, which may help reduce joint inflammation and pain.

2. Lignans: flaxseeds contain lignans, a type of phytoestrogen that has anti-inflammatory effects.

Anti-Inflammatory Properties of Flaxseed

Flaxseed and flaxseed oil are important dietary sources of antioxidants due to their content of lignans, phenolic acids, and tocopherols. Flaxseed can lower the concentration of inflammatory markers. Mirfatahi et al. investigated the effects of flaxseed oil consumption on serum systemic and vascular inflammation markers in 34 hemodialysis patients, who were randomly assigned to either the flaxseed oil or the control group. The patients in the flaxseed oil group received 6 g of flaxseed oil daily for 8 weeks, and the control group received 26 g of medium-chain fatty acids.

Antioxidant effects

Antioxidant properties:

Flaxseeds contain antioxidant that help protect cells from damage caused by free radicals. This may help reduce oxidative stress and inflammation in the joints.

Reducing oxidative stress:

Flaxseeds may help reduce oxidative stress, which is thought to contribute to the development and progression of arthritis.



Conclusions

Sesame, one of the oldest oil crops available, is a versatile plant that contains a high nutritional value. In addition to making oil, sesame seeds are often made into sesame paste, sesame milk, sesame paste, and other foods. Currently, with the continuous research on sesame, more bioactive components are being explored and applied, effectively promoting the development of the sesame processing industry.

Regular flaxseed consumption improves lipid profile by lowering total cholesterol, LDL cholesterol, and triglycerides, and by increasing HDL cholesterol in healthy people with excess body weight and in patients with dyslipidemia. This may be crucial in the prevention of many diseases, particularly cardiovascular diseases.

Regularly consuming sesame seeds and flax seeds in equal quantities they helps to reduce rheumatoid arthritis.

In morning consuming 1 teaspoon of sesame seeds and flax seeds powder it's reduced rheumatoid arthritis pain.

Reference

1. Ghani Noor A, Umran Mahfoodha A, Shawkat Muayad S. Cytotoxic activity of ethanol extract of *Sesamum indicum* seeds to cancer-cell lines-in-vitro. Iraqi Cancer Med Genet
2. Fattahi Mf. Mirshafiey A Prostaglandins and rheumatoid arthritis, Arthritis.
3. Newbold BB Chemotherapy of arthritis induced in rats by mycobacterial adjuvant. Br J-Pharmacol.
4. Garrett NE, Mapp Pl, Eruwys SE, Kidd BL: Blake DR. Role of substance Pinin flammatory arthritis. Ann Rheum Dis.
5. Ohkawa H. Chishi N, Yagi K. Assay for lipid peroxides in animal tissues by -thiobarbituric-acid reaction. Anal Biochem
6. Krati Chauhan, Jagmohan S. Jandu; Lawrence H. Bront, Mohammed A. Al-Dhahir. Rheumatoid Arthritis.
7. Panpan Wei, Fenglan Zhao, Zhen Wang', Qibao Wang, Xiaoyun Chai, Guige Hou and Qingguo Meng Sesame (*Sesamum indicum* L.): A Comprehensive Review of Nutritional Value, Phytochemical Composition, Health Benefits, Development of Food, and Industrial Applications
8. Wioletta Nowak and Malgorzata Jeziorek The Role of Flaxseed in Improving Human Health.