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Life Extension Update Exclusive

Green tea compound may reduce inflammation in rheumatoid arthritis

The results of a study presented on April 29 at the Experimental Biology 2007 meeting in Washington, DC indicate that a compound found in green tea may have preventive and therapeutic benefits for rheumatoid arthritis. Rheumatoid arthritis is an autoimmune disease characterized by inflammation, pain swelling, and gradual erosion of bone and cartilage.

Salah-uddin Ahmed, PhD and colleagues with the University of Michigan Health System incubated cultured synovial fibroblasts from the lining of the joint capsules of rheumatoid arthritis patients with epigallocatechin-3-gallate (EGCG) from green tea. These cells, as well as fibroblast cultures not treated with EGCG, were subsequently stimulated with interleukin-1beta, a pro-inflammatory cytokine produced by the immune system that is involved in the joint destruction experienced by people with the disease.

The administration of interleukin-1beta to untreated cells initiated a sequence of events resulting in the production of IL-6 and cyclooxygenase-2 (COX-2), two molecules that cause bone erosion in the joints of rheumatoid arthritis patients. The research team found that EGCG inhibited the production of the two proteins as well as a hormone-like substance known as prostaglandin-E2, which causes joint inflammation.

Dr Ahmed, who is a research investigator with the Division of Rheumatology at the University of Michigan Health System, commented, "Our research is a very promising step in the search for therapies for the joint destruction experienced by people who have rheumatoid arthritis."

His laboratory is now investigating the role of EGCG in gene expression, and plans to test the compound in animal models of the disease to confirm its benefits. They hope the research will lead to clinical trials of EGCG in rheumatoid arthritis patients.

Health Concern

Rheumatoid arthritis

The earliest signs of rheumatoid arthritis (RA) are tiny injuries to the synovial membrane and an increase in the number of synovial cells. At this point, long before symptoms are experienced, there is evidence of immune cell penetration into the synovial membrane. Over time, the immune response continues to gain momentum and inflict damage on the synovial membrane.

The exact mechanism of bone and cartilage destruction during RA is not completely understood. One theory suggests that the pro-inflammatory cytokines interleukin-1 and tumor necrosis factor-alpha (TNF-alpha) stimulate the production of enzymes that degrade cartilage and inhibit the production of new cartilage and also contribute to the local demineralization of bone by activating

osteoclasts (cells that break down bone) (Kasper DL et al 2005).

Glucosamine is a naturally occurring substance that is used to help build joints. While it is normally thought of in the context of osteoarthritis (OA), animal studies have indicated that it may also be a novel anti-inflammatory and joint-protective agent for people with RA. In one study, arthritic rats given glucosamine experienced a significant decrease in the progression of their disease (Hua J et al 2005).

There is ample evidence to suggest that compounds found in green tea, including the polyphenol epigallocatechin-3-gallate (EGCG), can interfere with the progression of arthritis. During arthritis, interleukin-beta causes an inflammatory response that enhances the expression and activity of MMPs, which are known to degrade cartilage. Studies have already shown that green tea extracts inhibit the expression of inflammatory cytokines in arthritic joints, and newer studies suggest that EGCG can also inhibit the expression of interleukin-beta and MMPs. Studies have suggested that EGCG from green tea also inhibits the inflammatory cytokines COX-2 and inducible nitric oxide synthase, which are induced by interleukin-beta (Ahmed S et al 2002, 2004). Overall, laboratory studies found that EGCG was nontoxic and that green tea consumption was effective at preventing arthritis and may benefit arthritis patients by reducing inflammation and slowing the breakdown of cartilage (Adcocks C et al 2002).

http://www.lef.org/protocols/immune_connective_joint/rheumatoid_arthritis_01.htm

Featured Products

ArthroMax™ with Fruitex®B

As people age, systemic inflammation can inflict degenerative effects throughout the body. A primary cause of this destructive cascade is the production of cell-signaling chemicals known as inflammatory cytokines. Along with these dangerous cytokines, imbalances of hormone-like messengers called prostaglandins also contribute to inflammatory processes.

Nobiletin is a citrus flavonoid that has demonstrated potent effects in suppressing destructive cytokines such as tumor necrosis factor alpha and interleukin-1 beta. In addition, nobiletin has demonstrated natural COX-2 inhibiting properties without affecting beneficial COX-1. Suppression of the COX-2 enzyme limits the production of joint damaging prostaglandin E2. A special Boswellia extract known as 5-Loxin® inhibits the 5-lipoxygenase enzyme, reducing levels of joint damaging leukotriene B4.

Glucosamine provides the underlying structural foundation for joints, while methylsulfonylmethane (MSM) provides crucial sulfur compounds that are so important to maintain comfortable joint function.

http://www.lef.org/newshop/items/item00903.html

Mega Green Tea Extract

The active constituents in green tea are polyphenols, with an antioxidant called epigallocatechin-3-gallate (EGCG) being the most powerful. The antioxidant activity of EGCG is about 25-100 times more potent than vitamins C and E. One cup of green tea may provide 10-40 mg of polyphenols and has antioxidant effects that are greater than a serving of broccoli, spinach, carrots, or strawberries.

http://www.lef.org/newshop/items/item00953.html

Life Extension magazine

Green tea: Natural support for healthy weight control, by David Nayor

While green tea's medicinal properties have been described for more than 1,000 years, one of its most timely benefits may be supporting weight management by increasing metabolism and promoting fat burning. With nearly two thirds of the American population now overweight or obese—and thus at heightened risk for metabolic syndrome, heart disease, cancer, and other life-threatening ailments—effective weight-control strategies are fast becoming a matter of life and death.

In addition to promoting healthy body weight and composition, green tea may help ward off numerous health conditions that afflict aging adults, from cataracts to autoimmune disorders.

http://www.lef.org/magazine/mag2007/apr2007_report_green_tea_01.htm

If you have questions or comments concerning this issue or past issues of *Life Extension Update*, send them to ddye@lifeextension.com or call 954 202 7716.

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