NUTRITIONAL SUPPORT FOR INFLAMMATION

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Shari Cheves • www.healthypixels.com

Background

Inflammation is an immune response that normally protects the body from infection and injury. Acute inflammation is the body's initial short-term, protective reaction; chronic inflammation is a prolonged vicious cycle resulting in cellular destruction and disease. It is not clear what causes inflammation to spiral out of control, but once it does, conditions can develop like acne, asthma, and heart disease or autoimmune diseases like diabetes, rheumatoid arthritis, and multiple sclerosis. Suspected triggers include genetic predisposition, stress, environmental toxins, bacteria or viruses, and diet. Airborne and food allergies are a major cause of chronic inflammation; identifying and treating allergies can help prevent or reduce inflammation and support the immune system.

There are dozens of drugs available for blocking inflammation, but they can disrupt different immune mechanisms in the body that may be beneficial. For example, NSAIDs (nonsteroidal anti-inflammatory drugs) like Motrin and Aleve cause intestinal permeability that may increase absorption of allergens, bacteria, fungus, and other toxins. Fortunately there are natural ways of reducing inflammation with potential to relieve and even reverse acute or chronic conditions.

Testing for Inflammation

Testing for hs-CRP (high-sensitivity C-reactive protein) levels reflect general inflammation in the body and is being associated with an increasing number of conditions including cardiovascular disease, arthritis, diabetes and some cancers. Testing for additional inflammatory markers like plasminogen activator inhibitor-1, interleukin-6 and serum amyloid A is becoming even more useful in evaluating disease and risk. (1)

Reducing Inflammation

Environment, lifestyle, and nutrition can trigger inflammation by weakening the immune system in various ways. Anxiety, lack of sleep, and airborne toxins are linked to raised CRP levels. Other autoimmune conditions like allergies also perpetuate the inflammatory cycle and worsen conditions. Inflammation increases in diets high in saturated fat or refined grain or with consumption of fried starchy foods like potato chips and french fries. Omega-6 fatty acids - namely arachidonic acid - also amplify inflammation. (2) Arachidonic acid occurs in fatty red meat, duck, turkey, chicken, pork, some fish, and eggs. Omega-3 fatty acids compete with omega-6s in metabolism, and the excess of omega-6s in the Western diet increases inflammation.

FOODS/SUPPLEMENTS TO HELP REDUCE INFLAMMATION	IMPORTANT CONCERNS/DOSAGE
Omega-3 fatty acids contain substances that reduce inflammation. Polyunsaturated fatty acids can be easily oxidized in the body leading to potential damage and disease. Alpha-linolenic acid is a type of omega-3 that lowers CRP levels and is found in flaxseed, canola oil, kale, broccoli, Brussels sprouts and various nuts.	Take fish oil supplements with food high in antioxidants like beans, berries, apples, and pecans. If you increase these fatty acids, also increase antioxidants like vitamin C, glutathione (through N-acetylcysteine supplements), and vitamin E up to 200 IU per day.
Magnesium is associated with anti-inflammatory activity. Magnesium is found in pumpkin seeds, spinach, chard, seaweed, soybeans, salmon, halibut, cocoa, sunflower seeds, and sesame seed.	Supplement with 50 mg two or three times throughout the day (100-150 mg total) with a glass of water after a meal.
Vitamin B6 showed protection against high CRP levels in a recent study. (189) Foods containing high levels of B6 include red and green peppers, casaba melon, cod fish, spinach, and garlic.	Dosages vary depending upon level of deficiency. Consult a physician before supplementing. RDA varies betwen 1.3-1.7 mg for different ages.
Vitamin K is also associated with reduced inflammation. (15) Spinach, Brussels sprouts, Swiss chard, green beans, asparagus, broccoli, and kale are high in vitamin K. (43)	Take 100 mcg of Vitamin K2 daily with meal that contains fat for best absorption. *High intake of vitamin K is not recommended for individuals taking anticoagulant medications such as Warfarin (coumadin).*

FOODS/SUPPLEMENTS TO HELP REDUCE INFLAMMATION

Amino acids are emerging as key players in reducing inflammation. L-arginine shows benefits for cardiovascular risk, including lowering blood pressure. Glutamine also reduces the inflammatory response in studies.

Cocoa shows anti-inflammatory activity in neurons associated with migraines and TMJ. (7)

Dairy (possibly through bovine glycomacropeptide) may improve inflammation associated with obesity.

Nuts contain fatty acids, alpha-linolenic acid, antioxidants, magnesium and fiber that link to reduced inflammation. (14) Walnuts have been studied most for their beneficial effects.

Antioxidants Block Inflammation

Foods highest in antioxidants include:
Small red, kidney, pinto beans, black beans
Wild blueberries
Cranberries
Blackberries, raspberries, strawberries
Artichokes
Dried prunes
Apples
Pecans
Sweet cherries
Black plums

Certain spices - turmeric, ginger, black pepper, cinnamon - have proven anti-inflammatory activity. (10, 11, 12, 13)

Gingko biloba has recently been studied for its protective effects on cataracts, dementia, and other inflammatory disorders, though mechanisms and dosages are unclear. (16,17) Gingko biloba tea or tablets are available in health food stores.

Brassica vegetables (broccoli, Brussels sprouts, cabbage, cauliflower, swedes, turnips, and collard greens) contain 3,3'-diindolylmethane, a substance being linked to alleviating experimental arthritis. (18) Cooked cabbage contains much higher concentrations of this substance.

Polyphenols - Many polyphenols show anti-inflammatory combination that drugs cannot yet replicate. Foods that contain high amounts of polyphenols that have been shown to reduce inflammation include apple, onion (quercetin), dark roasted coffee (caffeic acid), red grapes (reservatrol), Brussels sprouts, kale, cabbage, and broccoli (indole-3-carbinol), berries, rhubarb, oats, green tea, and olive oil. *High amounts of phenolics must be used with caution, as some people are sensitive to salicylates, a subgroup of phenols.*

Slow boiled or roasted foods at reasonably low temperatures can help reduce inflammation by lowering amounts of harmful substances called AGEs (advanced glycation end products). AGEs are higher in foods cooked by grilling, frying or broiling in moderate to high temperatures. AGEs induce inflammation and are associated with increased allergenicity and increased intestinal permeability.

Vitamins and minerals work synergistically to balance the body and the interactions are complex and not well understood. An integrative approach, including professional nutritional support, can manage the complexity with tests, diagnoses, treatment, and follow-up.

New Directions

Traditional Chinese Medicine including herbs and acupuncture techniques is proving to remedy pain associated with rheumatoid arthritis and other inflammatory disorders.

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