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Natural Anti-Inflammatory Supplements: Research Status and Clinical Applications

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In recent years, scientific studies have demonstrated that many forms of arthritis and joint inflammatory conditions can be managed effectively through specific dietary and supplementation practices, in addition to joint mobilization; manipulation; muscle therapy; acupuncture; and exercise.[1] Beyond the use of glucosamine sulfate as an effective intervention to halt joint cartilage destruction and help regenerate new cartilage in osteoarthritis cases, substantial clinical and experimental evidence supports the use of other natural health products, which demonstrate proven abilities to block inflammation, and reduce the signs and symptoms of arthritis and other joint inflammatory conditions. Studies indicate that many of these natural agents provide similar efficacy as conventional anti-inflammatory drugs, and are safer to use with respect to reported adverse side-effects.

Most medical practitioners have failed to embrace these alternative anti-inflammatory agents, and tend to rely primarily on synthetic anti-inflammatory drugs as their principal approach to managing these problems.[2] It is well documented that these nonsteroidal anti-inflammatory drugs (NSAIDs) produce intestinal tract ulcers (with potential internal bleeding) in 10-30 percent of long-term users, and erosions of the stomach lining and intestinal tract in 30-50 percent of cases.[3] As a result of these side effects, NSAID use is associated with 10,000 - 20,000 deaths per year in the U.S.[4] Even the new COX-2 inhibitor drugs have only been reported to reduce intestinal tract damage by 50 percent, and their toxicity to the liver and kidneys is still under review.[5] Anti-inflammatory drugs have been shown to accelerate damage and erosion of joint cartilage, advancing the osteoarthritic process. Conventional NSAIDs are also known to cause liver and kidney damage with long-term use.[6] These and other statistics have lead certain esteemed investigators to conclude: "The epidemiological data highlight the importance of implementing acetylsalicylic acid (ASA)/NSAID therapy only when strictly necessary."[7]

Reducing Inflammation Naturally

The discovery that certain natural agents produce marked anti-inflammatory effects presents an opportunity for chiropractors and other natural health practitioners to add an important and effective adjunct to the management of these cases.

As such, a review of the physiological action and clinical studies, involving the use of proven natural anti-inflammatory herbal agents, enables practitioners to use these substances in a safe and responsible way, and thereby help patients eliminate or minimize their reliance upon more dangerous NSAIDs and other synthetic anti-inflammatory drugs. Experimental research reveals that the efficacy of many natural anti-inflammatory agents stems from their ability to modulate the activity of the enzymes, cyclooxygenase and/or 5-lipoxygenase.[8] The pathophysiology of joint inflammatory conditions involves the conversion of arachidonic acid to prostaglandin series -2 (PG-2) by the cyclooxygenase enzyme. PG-2 synthesis is known to produce a pro-inflammatory effect, exacerbating joint inflammatory conditions. Accordingly, the conversion of arachidonic acid to leukotriene B4 (LTB-4), by the 5-lipoxygenase enzyme within white blood cells, is also known to contribute to inflammation. White blood cell count in normal synovial fluid is less than 100ml on average. However, cellular response rises to 800ml or more in osteoarthritis and much higher than this in rheumatoid diseases, implicating white blood cells in the T-cell-mediated inflammatory response in inflammatory joint conditions.[9]

As is the case with many synthetic anti-inflammatory drugs, the active constituents of anti-inflammatory herbs have been shown to block the activity of the cyclooxygenase and lipoxygenase enzymes, inhibiting the synthesis of pro-inflammatory eicosanaoids of the PG-2 and LTB-4 series. These natural substances have been shown to reduce inflammation and pain associated with various types of arthritis and traumatic joint injuries. Unlike their synthetic counterparts, they have not been shown to cause erosion injury to the intestinal tract, accelerate cartilage destruction or produce liver and kidney toxicity.[8] For these reasons, the following herbal agents can be considered viable alternatives to conventional anti-inflammatory drugs in a large percentage of arthritic patients and those suffering from other joint inflammatory conditions.

Effective Anti-Inflammatory Herbs and Supplements

Curcumin is the active anti-inflammatory agent found in the spice turmeric. It has been shown to inhibit the activity of the 5-lipoxygenase and cyclooxygenase enzymes, blocking the synthesis of pro-inflammatory eicosanoids (PG-2, LTB-4). A large double-blind study demonstrated that curcumin was as effective as a

powerful anti-inflammatory drug (phenylbutazone) in reducing pain, swelling and stiffness in rheumatoid arthritis patients. It has also been shown to be effective in the treatment of postsurgical inflammation. Other studies indicate that curcumin can lower histamine levels and is a potent antioxidant. These factors may also contribute to its anti-inflammatory capabilities.

For best results, practitioners should consider using a 95-percent standardized extract of curcumin derived from turmeric. As a singular agent, the daily dosage to consider is 400-600mg, taken one to three times per day. (Lower doses can be used as part of a combination formula containing other anti-inflammatory agents). Side effects are rare, but primarily include heartburn and esophageal reflux. As curcumin inhibits the cyclooxygenase enzyme system, it may reduce platelet aggregation and thus may potentiate the effects of anti-coagulant drugs. To date, no bleeding disorders have been reported with curcumin supplementation, but its concurrent use with warfarin or coumadin should be considered a contraindication.[2,8,10,11,12,13,14]

Boswellia - In clinical studies, the gum resin of the boswellia tree (yielding 70 percent boswellic acids) has been shown to improve symptoms in patients with osteoarthritis, and rheumatoid arthritis.[12,13] Research indicates that boswellic acids inhibit the 5-lipoxygenase enzyme in white blood cells. As a singular agent, the usual dosage is 150mg, one to three times per day. (Again, lower doses are effective when combined with other natural anti-inflammatory agents.) Boswellia appears to have no important side-effects or drug-nutrient interactions of concern.[15,16]

White Willow Bark Extract provides anti-inflammatory phenolic glycosides, such as salicin, which have been shown to be effective in the treatment of arthritis, back pain and other joint inflammatory conditions. These phenolic glycosides are known to inhibit cyclooxygenase, blocking the production of PG-2, and exert a mild analgesic effect. Unlike ASA, naturally occurring salicin (salicylic acid) does not irreversibly inhibit platelet aggregation, reducing the potential for a bleeding disorder. White willow extract has been shown to be slower acting than ASA, but of longer duration in effectiveness. The usual dosage is 20-40mg of salicin, one to three times per day (note that 100mg of white willow extract at a 15 percent standardized extract of salicin content yields 15mg of salicin per dosage. A lower dosage can be used as part of a combination formula containing other anti-inflammatory agents).

Side-effects are rare, but primarily include nausea, headache and digestive upset. Contraindications may include conditions where ASA is contraindicated, including gout; diabetes; haemophilia; kidney disease; active peptic ulcer; glucose-6-phosphate dehydrogenase deficiency; and possibly asthma. However, the

salicin content in a single dosage of white willow extract is very low compared to the content of ASA (e.g., 15mg vs. 320mg); thus, these conditions may not be absolute contraindications for the use of white willow bark extract. It is important to realize that besides salicin, white willow extract contains other phenolic glycosides, which are also known to possess anti-inflammatory properties.[8,17,18,19]

Ginger Root Extract contains oleo-resins that have shown clinical benefit in the management of various arthritic and muscle inflammation problems, including rheumatoid arthritis, osteoarthritis, and myalgias. The active constituents in this regard have are gingerols (oleo-resins), which inhibit the cyclooxygenase and lipoxygenase enzymes. The usual dosage is 500mg, one to three times daily, standardized to a five-percent gingerol content. (A lower dosage can be used as part of a combination formula containing other anti-inflammatory agents). Side-effects are rare, but include heartburn and digestive upset. It should not be given to patients with gallstones. It may also induce a mild anticoagulant effect (by inhibiting cyclooxygenase enzyme in platelets), therefore it should not be taken concurrently with warfarin of coumadin. However, there are no reports of bleeding disorders with ginger supplementation and no adverse drug - nutrient interactions have been reported in the scientific literature to date.[2,8,14,20,21]

Bromelain contains anti-inflammatory enzymes that have the proven ability to suppress the inflammation and pain of rheumatoid arthritis and osteoarthritis, sports injuries, and other joint inflammatory conditions. Bromelain has been shown to inhibit the cyclooxygenase enzyme, inhibiting the synthesis of PG-2. Bromelain also helps to break down fibrin (fibrinolytic), thereby minimizing local swelling. The usual dosage is 400mg, one to three times per day (a lower dosage can be used as part of a combination anti-inflammatory formulation). Bromelain may inhibit platelet clotting and is a known for its fibrinolytic properties. Therefore, it may potentiate the effects of anticoagulant drugs such as warfarin and coumadin, and should not be recommended in these cases.[2,8,14,22,23,24]

Quercetin is a bioflavonoid compound that blocks the release of histamine and other anti-inflammatory enzymes at supplemented doses (minimum 100-1500 mg per day). Although human studies with arthritic patients are lacking at this time, anecdotal evidence is strong for this application, as is experimental research investigation. There are no well-known side effects or drug-nutrient interactions for quercetin. [14,25,26,27]

Devil's Claw contains the anti-inflammatory agent harpogoside. Devil's claw has demonstrated efficacy in the management of low back pain and is used traditionally as an anti-inflammatory by numerous southern African tribes. The usual dosage is 100-400 mg, one to three times per day (a lower dosage can be used if

part of a combination anti-inflammatory formula). The only consistently reported side-effect is mild digestive upset on rare occasions. It is contraindicated in patients with active gastric ulcers (may increase gastric acid secretion) and in patients taking warfarin or coumadin (due to its anticoagulant effects).[8,14,28,29]

Clinical Application

The body of evidence supports the use of natural anti-inflammatory agents as viable alternatives to synthetic drugs or as a means to help patients lower their requirements for conventional anti-inflammatory pharmaceutical agents. A number of quality-oriented companies manufacture single and combination natural anti-inflammatory supplement products that meet the above dosage and standardized grade criteria, along with dietary changes to lower arachidonic concentrations, support joint cartilage synthesis and promote the formation of anti-inflammatory eicosanoids (e.g., PG-1 and PG-3). Chiropractors interested in more natural, safe and effective interventions to help manage joint inflammatory conditions may consider recommending the use of these herbal and accessory nutrients as an adjunct to the management of arthritis and other inflammatory joint conditions.

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