Chronic Inflammation

Safe, Effective Relief from an Ancient Herb

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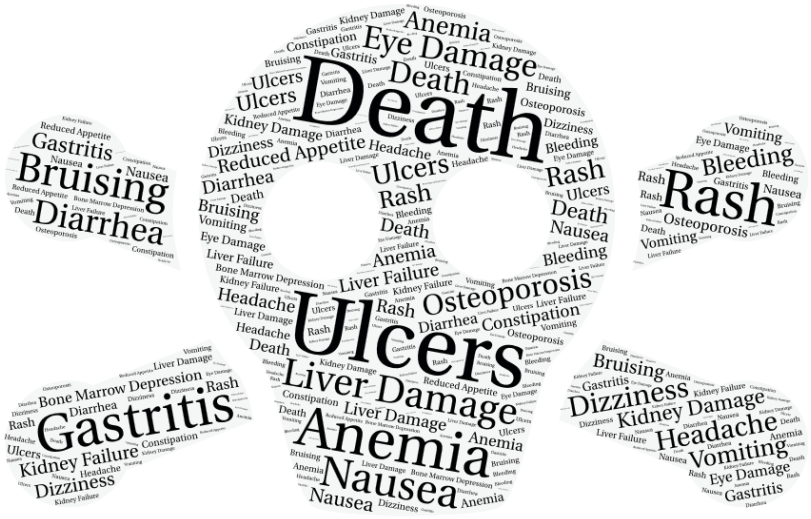
Inflammation

Inflammation is a complex process involving multiple actions/reactions and a wide variety of biological substances. Inflammation is triggered by the body's immunological response to tissue damage. When an inflammatory response is triggered by something other than foreign substances this can result in complications including chronic asthma, bronchitis, chronic inflammatory arthritis, hepatitis, psoriasis, ulcerative colitis, and Crohn's disease.

Medical professionals have been searching for a solution to chronic inflammation since its discovery. Prescription drugs used to treat chronic inflammation are coupled with side effects that are often worse than the symptoms they promise to relieve. Gastritis, osteoporosis, ulcers, bone marrow depression, kidney damage, eye damage, liver damage, bruising, and anemia are just some of the dangerous side effects of these drugs.

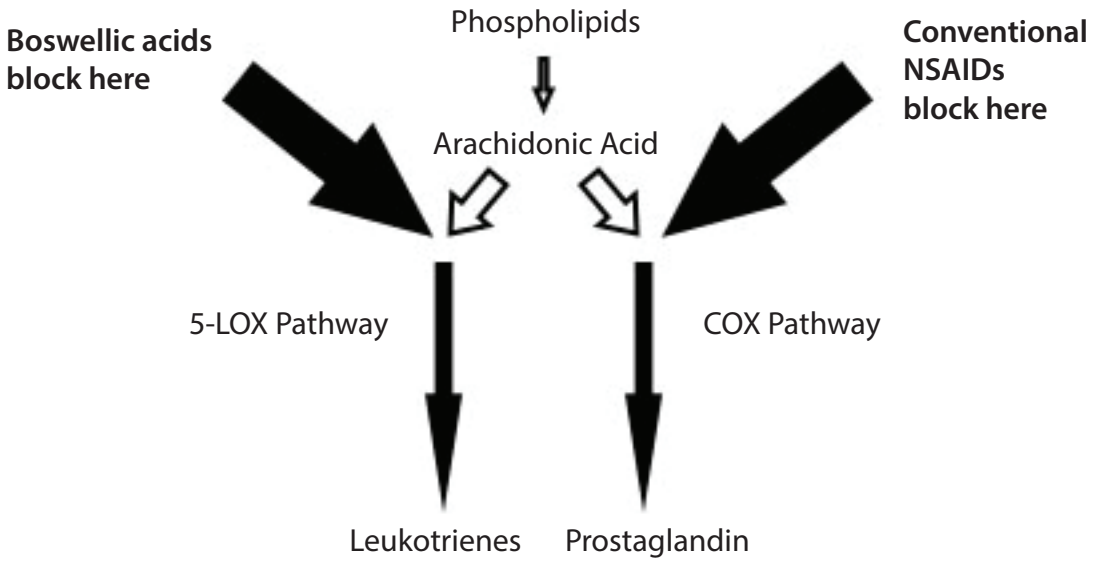


Inflammatory signaling molecules known as leukotrienes trigger inflammation in the human body. Overproduction of these molecules may result in chronic inflammatory conditions. The 5-lipoxygenase (5-LOX) pathway is the major source of proinflammatory leukotrienes. 5-LOX breaks down arachidonic acid to pro-inflammatory compounds like leukotriene, a molecule that attacks joints, arterial walls, and other tissues. 5-LOX itself facilitates undesirable cell division changes. Excessive 5-LOX activity is associated with 7 of the leading 10 causes of death in the US, causing more than 1.5 million deaths annually[1].

The enzyme COX-2 is responsible for producing another inflammatory signaling molecule known as prostaglandin E2 (PGE2). PGE2 is also a "switch" for activating the fever response[2].

Mechanism of Action

While Boswellic acids inhibit leukotriene synthesis via 5-LOX inhibition, there is no effect on COX activities. This explains why, unlike NSAIDs, Boswellia has no undesirable side effects. Boswellia has also been shown to shrink inflamed tissue by improving blood flow to the affected area as well as enhancing the repair of blood vessels damaged by inflammation[8].



A study published in the Journal of Ethnopharmacology[9] found that when Boswellia serrata was introduced into a 5-LOX test system, where suspensions of rat peritoneal neutrophils were stimulated by calcium and calcium ionophore A23187 to produce leukotrienes, Boswellia serrata significantly decreased production of leukotrienes and total 5-LOX products; there was no effect on cyclooxygenase (COX) activities. From this study, the researchers concluded:

> [Boswellia serrata] is the first selective, direct, non-competitive and non-redox-type inhibitor of 5-lipoxygenase, the key enzyme for leukotriene biosynthesis.
>
> Experimental and clinical usage of Boswellia indicates it has none of the side-effects on blood pressure, heart rate, or the gastric irritation and ulcers associated with many anti-inflammatory and anti-arthritic drugs.

NSAIDs

The most common treatment for inflammation are nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen. However, NSAIDs have dangerous side effects that limit their effectiveness for long-term use. The most common side effects are[3]:

- Vomiting
- Nausea
- Constipation
- Diarrhea
- Reduced Appetite
- Headache
- Dizziness
- Rash

Long term use of NSAIDs may lead to more serious side effects such as ulcers, bleeding, kidney failure, and liver failure. A statement from a July 1998 issue of The American Journal of Medicine illustrates the severity of NSAID toxcitity[4]:

> Conservative calculations estimate that approximately 107,000 patients are hospitalized annually for nonsteroidal anti-inflammatory drug (NSAID)-related gastrointestinal (GI) complications and at least 16,500 NSAID-related deaths occur each year among arthritis patients alone. The figures of all NSAID users would be overwhelming, yet the scope of this problem is generally under-appreciated.

NSAIDs inhibit the enzyme COX-2 to prevent inflammation, however they also block the enzyme COX-1, which is needed to maintain a healthy stomach lining. This is just one of the causes of NSAID toxicity, contributing to the development of ulcers and kidney problems[5]. These side effects are considered so serious that the FDA now requires a warning to be placed on NSAIDs and COX inhibitors.

The following is an example of the warning for a COX-2 inhibitor, celecoxib[6]:

WARNING: RISK OF SERIOUS CARDIOVASCULAR AND GASTROINTESTINAL EVENTS

See full prescribing information for complete boxed warning.

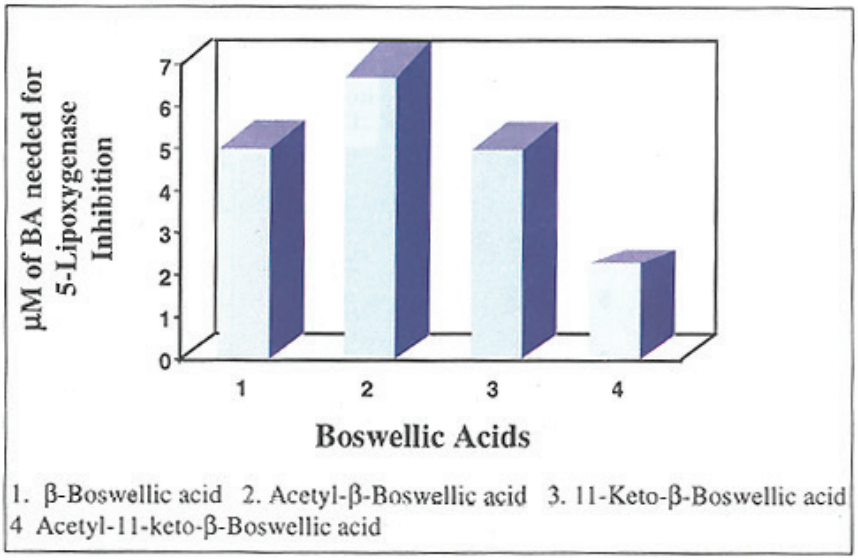
- **Nonsteroidal anti-inflammatory drugs (NSAIDs) cause an increased risk of serious cardiovascular thrombotic events, including myocardial infarction and stroke, which can be fatal. This risk may occur early in the treatment and may increase with duration of use. (5.1)**
- **Celecoxib is contraindicated in the setting of coronary artery bypass graft (CABG) surgery. (4, 5.1)**
- **NSAIDs cause an increased risk of serious gastrointestinal (GI) adverse events including bleeding, ulceration, and perforation of the stomach or intestines, which can be fatal. These events can occur at any time during use and without warning symptoms. Elderly patients and patients with a prior history of peptic ulcer disease and/or GI bleeding are at greater risk for serious GI events. (5.2)**

Boswellia Serrata

The Boswellia serrata plant is native to the dry habitats of India, Northern Africa, and the Middle East. The gummy resin of this tree, also known as frankincense, contains compounds which have been used for their anti-inflammatory and pain relieving effects for thousands of years.

New research into the Boswellia resin has shown that boswellic acids are powerful inhibitors of pro-inflammatory molecules, and may prove to be more effective than NSAIDs. Specifically, the acid 3-O-acetyl-11-keto-beta-boswellic acid (AKBA) has been identified for its ability to inhibit the enzyme 5-LOX, intervening at the cellular level to block its unwanted effects. Inhibiting this enzyme restricts synthesis of inflammatory signaling leukotrienes.

Figure 1 : Biological activity of various β-Boswellic acids in inhibiting the enzyme 5-Lipoxygenase



Various experimentation has illustrated the effect of boswellic acids on the 5-LOX enzyme[7]:

> Boswellic acids inhibit the leukotriene biosynthesis in neutrophilic granulocytes by a non-redox, noncompetitive inhibition of 5-lipoxygenase [5-LOX]. The effect is triggered by boswellic acids binding to the enzyme.

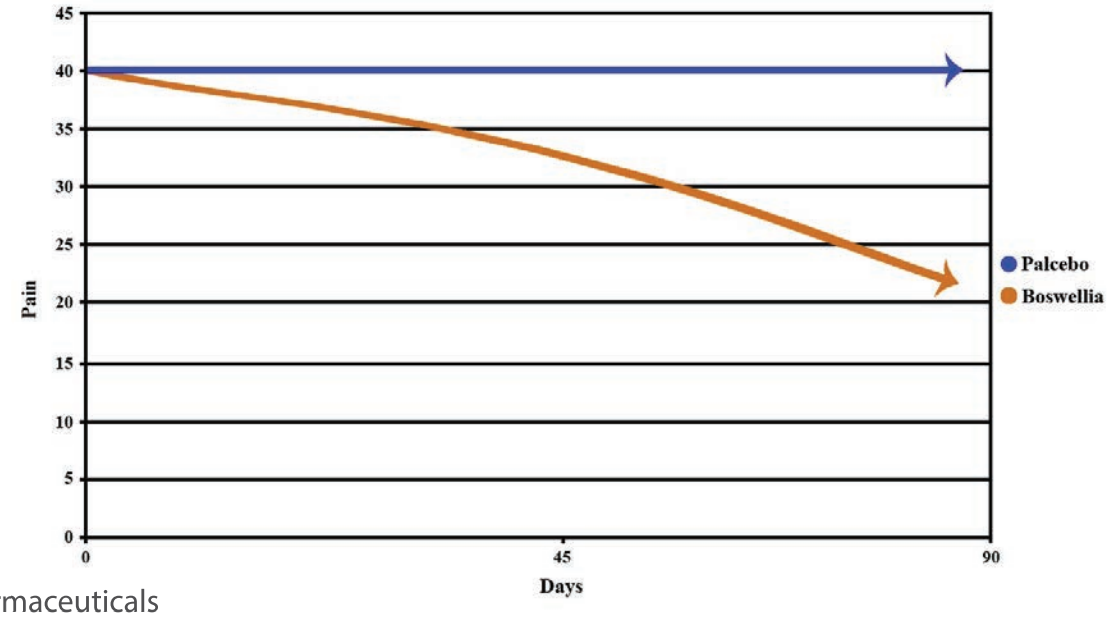
Clinical Use

Although Boswellia has been in use in the United States for a relatively short time, physicians and patients alike are already recognizing its potential. Dr. E. W. McDonagh, a Kansas City physician, has reported success treating over 350 patients suffering from a variety of advanced muscular and skeletal conditions for which other treatments had failed to help[8]. McDonagh is quoted as saying, "Many were taking multiple prescription and non-prescription medication and had developed side effects from them. Once taking Boswellia as prescribed, pain significantly reduced, or even vanished, in two to four weeks time."

A patient who had been suffering from arthritis of both knees submitted the following testimonial: "I had been taking the maximum dosage of Motrin per day in order to get relief. After one week [using Boswellia], I noticed immediate positive results and have now eliminated Motrin and take only Boswella." (James Merker, personal communication, January 25, 1994)

A randomized double blind placebo controlled study was conducted to assess the efficacy and safety of Boswellia extract in 30 patients of osteoarthritis of the knee[15]. All patients who received Boswellia reported decrease in knee pain as well as increased flexibility and walking distance. Based on these findings, the researchers concluded that Boswellia should be recommended to patients suffering from osteoarthritis of the knee and acknowledge that it may be useful in other forms of arthritis as well.

An analysis of two separate studies indicated that 90 days of treatment with Boswellia serrata extract improved symptoms of osteoarthritis compared to placebo[10]. Pain was recorded 0 to 100 point VAS scale (0 is no pain). In the placebo group mean pain remained at the starting measurement of 40 points; Boswellia serrata reduced mean pain by 17 points. The studies reported no serious side effects.



Veterinary Applications

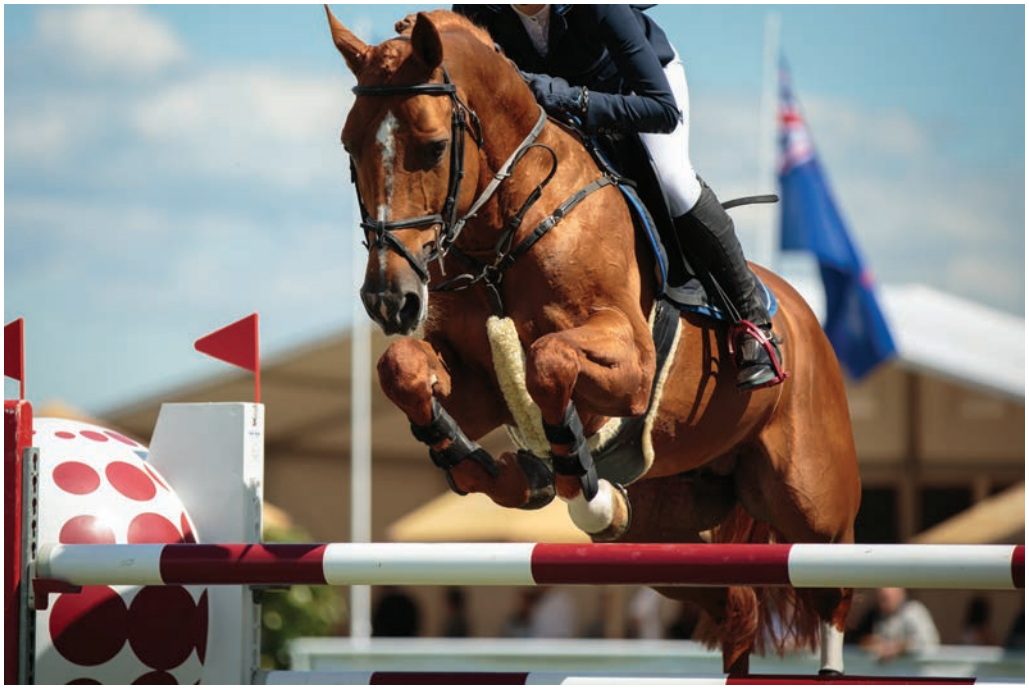
Boswellia has been shown to be effective in treating our animal companions as well.

Cutting is a western-style equestrian competition in which a horse and rider work as a team before a judge or panel of judges to demonstrate the horse's athleticism and ability to handle cattle. One horse that had been very successful in these competitions, having won over $250,000, was thought to have reached the end of its career after suffering an unfortunate stifle (knee) problem that kept the horse from further competition. As a last-ditch effort, the veterinarian put the horse on Boswellia. "After 30 days of treatment the horse was once again sound, and finished in the money in Las Vegas in a cutting competiton scoring 171 points."[11]

A veterinarian based in Seattle, WA has reported "considerable improvement among both cats and dogs suffering from arthritis."[8]

Patrick J. Moloney, D.V.M., of Louisville, found that Boswellia improved the condition of horses with a variety of chronic soreness and arthritis:

> I was particullary impressed by the relief we obtained in a case of chronic post-operative arthritis of the knee. That horse had significant post surgical pain following a third carpal bone procedure. After just a few days of boswellia administration he was dramaticallly better. Incidentally, he had been quite refractory to conventional therapy with NSAIDs. (Personal communication, July 1, 1992)



Summary

Chronic inflammation can lead to various debilitating symptoms. The primary treatment for many years has been NSAIDs which have side-effects so severe they rival the symptoms they promise to treat. Those who suffer from chronic inflammation are often so desperate for relief they have had no choice but to accept these side effects. New research into Boswellia, used for thousands of years in traditional medicine to treat conditions we now recognize as being caused by inflammation, shows that this ancient herb may be not only safer than NSAIDs, but more effective as well. This is largely due to Boswellia's ability to block the enzyme 5-LOX without effecting COX pathways.

Boswellia was found to be effective in the reduction of inflammation & joint swelling, as well as increasing mobility. Boswellia is the first herbal remedy to effectively and safely address inflammatory conditions and offer relief naturally. Boswellia is completely non-toxic and does not require a prescription.

Available in capsule and cream forms

Each capsule contains: 300mg. of boswellic acids.

Cream contains: 10% methyl salicylate and .025% of capsaicin in a base of 10% boswellia serrata and antioxidant vitamins A, C & E with a special liposome delivery system.

Boswella, a boswellia formula offered by Legere Pharmaceuticals, is available in capsules or cream, both of which provide excellent anti-inflammatory and analgesic activity.

Boswella may be effective for:

- ✓ Asthma
- ✓ Cervical spondylosis
- ✓ Everyday exertion, strain
- ✓ Gout
- ✓ Myositis
- ✓ Osteoarthritis
- ✓ Prostate inflammation
- ✓ Rheumatoid arthritis
- ✓ Sports injuries
- ✓ Soft tissue rheumatism

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