

Serrapeptase

Information and Research about Serrazyme

You should consult your Doctor if you are taking any medication.

The natural Chelation-Anti-Inflammatory Serrapeptase has had wide clinical use - spanning over twenty-five years throughout Europe and Asia - as a viable alternative to salicylates, ibuprofen and the more potent NSAIDs. Unlike these drugs, Serrapeptase is a naturally occurring, physiological agent with no inhibitory effects on prostaglandins and is devoid of gastrointestinal side effects.

Uses:

1. Cardiovascular Disease
2. Arthritis
3. Rheumatoid Arthritis
4. Lung Problems
5. Eye Problems
6. Runny Nose and sinusitis problems
7. Sports Injuries
8. Inflammation of any kind

Serrapeptase is a proteolytic enzyme isolated from the micro-organism *Serratia E15*. This enzyme is naturally processed commercially today through fermentation and was discovered in the silkworm intestine. This immunologically active enzyme is completely bound to the alpha 2 macroglobulin in biological fluids. Histological studies reveal powerful anti-inflammatory effects of this naturally occurring enzyme.

Serrapeptase digests non-living tissue, blood clots, cysts, and arterial plaque and inflammation in all forms. The late German physician, Dr. Hans Nieper, used Serrapeptase to treat arterial blockage in his coronary patients. Serrapeptase protects against stroke and is reportedly more effective and quicker than EDTA Chelation treatments in removing arterial plaque. He also reports that Serrapeptase dissolves blood clots and causes varicose veins to shrink or diminish. Dr. Nieper told of a woman scheduled for hand amputation and a man scheduled for bypass surgery who both recovered quickly without surgery after treatment with Serrapeptase.

Serrapeptase - Technical Information and Studies

Serrapeptase (Serrapeptase) has wide clinical use spanning over twenty-five years throughout Europe and Asia as a viable alternative to salicylates, ibuprofen and the more potent NSAIDs. Unlike these drugs, Serrapeptase is a naturally occurring, physiologic agent with no inhibitory effects on prostaglandins and is devoid of gastrointestinal side effects.

Serrapeptase is a proteolytic enzyme isolated from the micro-organism, *Serratia E15*. This enzyme is naturally present in the silkworm intestine and is processed commercially today through fermentation. This immunologically active enzyme is completely bound to the alpha 2 macroglobulin in biological fluids. Histologic studies reveal powerful anti-inflammatory effects of this naturally occurring enzyme.

Serrapeptase digests non-living tissue, blood clots, cysts, and arterial plaque and inflammation in all forms. The late German physician Dr. Hans Nieper used Serrapeptase to treat arterial blockage in his coronary patients. Serrapeptase protects against stroke and is more effective and quicker than EDTA Chelation treatments in removing arterial plaque. He also reports that Serrapeptase dissolves blood clots and causes varicose veins to shrink

or diminish. Dr. Nieper told of a woman scheduled for hand amputation and a man scheduled for bypass surgery who both recovered quickly without surgery after treatment with Serrapeptase.

A Potent Proteolytic Enzyme

The inflammatory response is an important mechanism for protecting the body from attack by invading organisms and faulty cells. In the case of immune dis-regulation, the body loses its ability to differentiate between innocuous and potentially dangerous substances. This defective mechanism results in a wide array of autoimmune diseases such as allergies, psoriasis, rheumatoid arthritis, ulcerative colitis, uveitis, multiple sclerosis and some forms of cancer.

Standard drug therapy for inflammatory-mediated diseases and trauma include steroids and non-steroidal anti-inflammatory agents (NSAIDs). Both classes of drugs offer temporary, symptomatic relief from swelling, inflammation and accompanying pain without treating the underlying condition. These drugs may also be immunosuppressive and cause dangerous side effects. The conscientious physician must weigh the benefits and long-term risks associated with the use of NSAIDs, especially in cases of rheumatoid arthritis. If left untreated, the inflammatory process itself can lead to limitation of joint function and destruction of bone, cartilage and articular structures.

NSAIDs are among the most widely prescribed drugs for rheumatoid arthritis and other inflammatory joint conditions. Their effects are mediated through inhibition of the biosynthesis of prostaglandins. They work by irreversibly blocking cyclooxygenase, the enzyme which catalyses the reactions of arachidonic acid to endoperoxide compounds. The neurological and gastrointestinal side effects of these agents have been reviewed in considerable detail. All of the NSAIDs, with the exception of Cytotec, inhibit prostaglandin E₁, a local hormone responsible for gastric mucosal cytoprotection. A common side effect from these medications is gastric ulcers. More serious adverse reactions such as blood dyscrasias, kidney damage and cardiovascular effects have been noted. Most physicians rotate among the ten most widely prescribed NSAIDs, as soon as one causes side effects or stops working.

The search for a physiologic agent that offers anti-inflammatory properties without causing side effects may have ended with the discovery of the Serratia peptidase (SP) enzyme. This anti-inflammatory agent is in wide clinical use throughout Europe and Asia as a viable alternative to salicylates, ibuprofen (sold as an OTC in the U.S.) and the more potent NSAIDs. Unlike these drugs, SP is a naturally occurring, physiologic agent with no inhibitory effects on prostaglandins and devoid of gastrointestinal side effects.

SP is an anti-inflammatory, proteolytic enzyme isolated from the microorganism, *Serratia* E15. This enzyme is naturally present in the silkworm intestine and is processed commercially today through fermentation. This immunologically active enzyme is completely bound to the alpha 2 macroglobulin in biological fluids. Histologic studies reveal powerful anti-inflammatory effects of this naturally occurring enzyme.

The silkworm has a symbiotic relationship with the *Serratia* microorganisms in its intestines. The enzymes secreted by the bacteria in silkworm intestines have a specific affinity to avital tissue and have no detrimental effect on the host's living cells. By dissolving a small hole in the ~ silkworm's protective cocoon (avital tissue), the winged creature is able to emerge and fly away. The discovery of this unique biological phenomenon led researchers to study clinical applications of the SP enzyme in man.

In addition to its widespread use in arthritis, fibrocystic breast disease and carpal tunnel syndrome, researchers in Germany have used SP for atherosclerosis. SP helps to digest atherosclerotic plaque without harming the healthy cells lining the arterial wall. Today, researchers consider atherosclerosis an inflammatory condition similar to other degenerative diseases. Some immunologists are even categorizing atherosclerosis as a benign tumour. Hardening and narrowing of the arterial wall is a cumulative result of microscopic trauma; inflammation occurs in the presence of oxidized lipids.

SP doesn't interfere with the synthesis of cholesterol in the body, but helps clear avital tissue from the arterial wall. It is important to note that cholesterol in its pure state is an antioxidant and a necessary component of the major organ systems in the body. The use of medications, which block cholesterol biosynthesis, may eventually damage the liver and compromise anti-oxidant status of the eyes, lungs and other soft tissues.

While studies with Serrapeptase in the treatment of coronary artery disease are relatively new, a wealth of information exists regarding its anti-inflammatory properties. SP has been used as an anti-inflammatory agent in the treatment of chronic sinusitis, to improve the elimination of bronchopulmonary secretions, traumatic injury (e.g. sprains and torn ligaments), post-operative inflammation and to facilitate the therapeutic effect of antibiotics in the treatment of infections. In the urological field, SP has been used successfully for cystitis and epididymitis.

Double-Blind Studies

SP has been admitted as a standard treatment in Germany and other European countries for the treatment of inflammatory and traumatic swellings. In one double-blind study of SP conducted by Esch et al at the German State Hospital in Ulm, 66 patients with fresh rupture of the lateral ligament treated surgically were divided in three randomised groups. In the group receiving the test substance, the swelling had decreased by 50% on the third post-operative day, while in the other two control groups (elevation of the leg, bed rest, with or without the application of ice), no reduction in swelling had occurred at that time. The difference was of major statistical significance. Decreasing pain correlated for the most part with the reduction in swelling. The patients receiving SP became pain-free more rapidly than the control groups. By the 10th day, all patients were free of pain in the SP-treated group. The therapeutic daily dose was 1-2 tablets (5 mg) 3 times daily.

In another double-blind study, the anti-inflammatory enzyme, SP, was evaluated in a group of 70 patients with evidence of cystic breast disease. These patients were randomly divided into a treatment group and a placebo group. SP was noted to be superior to placebo for improvement of breast pain, breast swelling and induration with 85.7% of the patients receiving SP reporting moderate to marked improvement. No adverse reactions were reported with the use of SP. The use of enzymes with fibrinolytic, proteolytic and anti-edemic activities for the treatment of inflammatory conditions of the ear, nose and throat has gained increasing support in recent years.

In a third double-blind study, 193 subjects suffering from acute or chronic ear, nose or throat disorders were evaluated. Treatment with SP lasted 7-8 days, two 5 mg tabs, t.i.d. After 3-4 days treatment, significant symptom regression was observed in the SP-treated group, while this was not noted in the control group. Patients suffering from laryngitis, catarrhal rhinopharyngitis and sinusitis noted markedly rapid improvement. The physicians' assessments of efficacy of treatment were excellent or good for 97.3% of patients treated with SP compared with only 21.9% of those treated with placebo. In a similar study of chronic bronchitis, conducted by a team of otolaryngologists, the SP-treated group showed excellent results compared with the placebo group in the improvement of loosening sputum, frequency

of cough and expectoration. Other improvements included the posterior nasal hydro rhea and rhinos enosis. The administration of SP reduces the viscosity of the nasal mucus to a level at which maximal transport can be achieved. It has also been demonstrated that the simultaneous use of the peptidase and an antibiotic results in increased concentrations of the antibiotic at the site of the infection.

The mechanisms of action of SP, at the sites of various inflammatory processes consist fundamentally of a reduction of the exudative phenomena and an inhibition of the release of the inflammatory mediators. This peptidase induces fragmentation of fibrinose aggregates and reduces the viscosity of exudates, thus facilitating drainage of these products of the inflammatory response and thereby promoting the tissue repair process. Studies suggest that SP has a modulatory effect on specific acute phase proteins that are involved in the inflammatory process. This is substantiated by a report of significant reductions in C3 and C4 complement, increases in opsonizing protein and reductions in concentrations of haptoglobulin, which is a scavenger protein that inhibits lysosomal protease.

Carpal tunnel syndrome is a form of musculol-igamentous strain caused by repetitive motion injury. Individuals who work at keyboard terminals are particularly susceptible to this condition. While surgery has been considered the first line treatment for carpal tunnel syndrome, recent studies reveal that the use of anti-inflammatory enzymes (e.g. SP and bromelain) in conjunction with vitamins B2 and B6 are also effective. The use of non-invasive, nutritional approaches to the treatment of this common condition will become more important as a generation of keyboard operators approach retirement.

Several research groups have reported the intestinal absorption of SP. SP is well absorbed orally when formulated with an enteric coating. It is known that proteases and peptidases are only absorbed in the intestinal area. These enzymes are mobilized directly to the blood and are not easily detectible in urine. Other enzymes with structural similarities have been reported to be absorbed through the intestinal tract. Chymotrypsin is transported into the blood from the intestinal lumen. Horseradish peroxidase can cross the mucosal barrier of the intestine in a biologically and immunologically active form. Several studies have appeared so far which refer to the systemic effects of orally given proteases and peptidases (e.g. SP), such as repression of oedema and repression of blood vessel permeability induced by histamine or bradykinin. These enzymes also affect the kallikrein-kinin system and the complement system, thus modifying the inflammatory response. In vitro and in vivo studies reveal that SP has a specific, anti-inflammatory effect, superior to that of other proteolytic enzymes.

A review of the scientific literature, including a series of controlled, clinical trials with large patient groups, suggests that Serrapeptase is useful for a broad range of inflammatory conditions. If one considers the fact that anti-inflammatory agents are among the most widely prescribed drugs, the use of a safe, proteolytic enzyme such as SP would be a welcome addition to the physician's armamentarium of physiologic agents.

References

1. Kee WH, Tan SL, Lee V, Salmon YM. The treatment of breast engorgement with Serrapeptase (Danzen): a randomized double-blind controlled trial. *Singapore Med J.* 1989;30(1):48-54.
2. Mizukoshi, D. et al. A double-blind clinical study of serrapeptase in the treatment of chronic sinusitis. *Igaku Ayrni* 109:50-62.1979.
3. Carratu, L. et al. Physio-chemical and rheological research on mucolytic activity of serrapeptase in chronic broncho-pneumopathies. *Curr. Ther. Res.* 28(6):937-951. 1980.

4. Braga, P.C. et al. Effects of serrapeptase on muco-ciliary clearance in patients with chronic bronchitis. *Curr. Ther. Res.* 29(5):738-744,1981.
5. Mazzonie, A. et al. Evaluation of serrapeptase in acute or chronic inflammation of otorhinolaryngology pathology: a multicentre, double-blind randomized trial versus placebo. *J. int. Med. Res.* 18(5):379-388,1990.
6. Kakinumu, A. et al. Regression of fibrinolysis in scalded rats by administration of serrapeptase. *Biochem. Pharmacol.* 31:2861-2866,1982.
7. Marly, M. Enzymotherapie anti-inflammatoire a l'aide de la serrapeptase: resultats cliniques en traumatologie et en ORL. *C RTherapeut.* 3:9-19,1985.
8. Odagiri, J. et al. Clinical applications of serrapeptase in sinusitis. *Med. Consult. New Remedy* 6:201-209, 1979.
9. Yamazaki, J. et al. Anti-inflammatory activity of TSP, a protease produced by a strain of *Serratia*. *Folia Pharmacol. Japon.* 6^302-314,1967.
10. Harad~, Y. Clinical efficacy of serrapeptase on buccal swelling after radical operation for chronic sinusitis. *Igaku Ayumi* 123:768-778.1982.
11. Matsudo, A. et at. Effect of serrapeptase (Danzen) on inflammatory edema following operation for thyropid disease. *Med. Consult. New Remedy* 18:171-175, 1981.
12. Fujitani, T. et al. Effect of anti-inflammatory agent on transfer of antibiotics to the maxillary sinus mucosa in chronic sinusitis. *Otorhinolaryngol. Clin. North Am.* 66:557-565. 1976.
14. Mazzonie, A. et al. Evaluation of serrapeptase in acute or chronic inflammation of otorhinolaryngology pathology: a multicentre, double-blind randomized trial versus placebo. *J. int. Med. Res.* 18(5):379-388,1990.
15. Kase, Y. et al. A new method for evaluating mucolytic expectorant activity and its application. II. Application to two proteolytic enzymes, serrapeptase and seaprose. *Arzneimittelforschung* 32:374-378,1982.
16. Marriott, C. Modification of the rheoloaical properties of mucus by drugs. *Adv. Exp. Med. Biol.* 144^75-84, 1982.
17. Majima. Y. et al. Effects of orally administered drugs on dynamic viscoelasticity of human nasal mucus. *Am. Rev. Respit. Dis.* 141:79-83.1990.
18. Miyata, K. Intestinal absorption of serrapeptase. *J ApplBiochem.* 1980:2:111-16.
19. Aso T. et al. Breast engorgement and its treatment: Clinical effects of Danzen (serrapeptase) an anti-inflammatory enzyme preparation. *The world of Obstetrics and Gynecology (Japanese).* 1981:33:371-9.
20. Esch PM, Gemgross H. Fabian A. Reduction of postoperative swelling. Objective measurement of swelling of the upper ankle joint in treatment with serrapeptase-a prospective study (German). *FortschrMed.* 1989;107(4):67-8, 71-2.
21. Majima Y, Inagaki M, Hirata K. Takeuchi K, M orishita A, Sakakura Y. The effect of an orally administered proteolytic enzyme on the elasticity and viscosity of nasal mucus. *Arch Otorhinolaryngol.* 1988;244(6):355-9.
22. Selan L, Berlutti F, Passariello C. Comodi-Ballanti MR, Thaller MC. ?roteolytic enzymes: a new treatment strategy for prosthetic infections? *Antimicrob Agents Cheroother.* 1993; 37(12):2618-21.
23. Koyama A, Mori J, Tokuda H, Waku M, Anno H, Katayama T, Murakami K, Komatsu H, Hirata M, Arai T, et al. Augmentation by serrapeptase of tissue permeation by cefotiam (Japanese). *Jpn JAntibiot.* 1986; 39(3):761-