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Are Fibrinolytics Key to Preventing Clogged Arteries?

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STORY AT-A-GLANCE

- Lumbrokinase, serrapeptase and nattokinase are proteolytic enzymes that act as natural anticoagulants by breaking down fibrin that forms blood clots
- Fibrinolytic enzymes are antihypertensive, anti-atherosclerotic, lipid-lowering and anti-platelet agents, which also have neuroprotective effects
- Nattokinase at a dose of 10,800 fibrinolytic units (FU) a day for 12 months "effectively managed the progression of atherosclerosis and hyperlipidemia" in one study
- Just one 2,000 FU dose of nattokinase enhanced fibrinolysis and anti-coagulation, activating multiple fibrinolytic and anti-thrombotic pathways simultaneously
- Lumbrokinase is nearly 30 times stronger than nattokinase and 300 times stronger than serrapeptase; if you are using a fibrinolytic enzyme, my strong personal preference and recommendation is to use lumbrokinase

Fibrinolytic agents, sometimes referred to as thrombolytic agents, are capable of dissolving blood clots that may block your veins or arteries. In general, cleaner arteries are a benefit to your cardiovascular health, which is one reason why fibrinolytic enzymes like lumbrokinase, nattokinase and serrapeptase should be on your radar.

In your body, enzymes regulate the rate of numerous biological reactions, speeding them up so necessary functions like digestion, muscle contractions and other aspects of cellular metabolism can occur.[1]

Lumbrokinase, serrapeptase and nattokinase are proteolytic enzymes that act as natural anticoagulants by breaking down fibrin that forms blood clots. Fibrin, a clotting material that restricts blood flow, is found both in your bloodstream and connective tissue such as your muscles. Fibrin accumulation is also responsible for scar tissue.

It is important to understand that when using these enzymes for fibrinolytic therapy they need to be taken on an empty stomach, at least one hour before or two hours after meals containing protein. Otherwise, these enzymes will be wasted in the digestion of the protein in your food and won't serve their fibrinolytic purpose.

Fibrinolytic Enzymes Help Manage Heart Disease

Fibrinolytic enzymes are antihypertensive, anti-atherosclerotic, lipid-lowering and anti-platelet agents, which also have neuroprotective effects.[2] Much research into fibrinolytic enzymes has focused on nattokinase (NK), an active ingredient in natto, or fermented soybeans. It's likely due to its high nattokinase content that natto consumption is linked to a decreased risk of heart disease mortality and increased longevity in the Japanese population.[3]

Nattokinase, produced by the bacteria Bacillus subtilis during fermentation of soybeans to produce natto,[4] is a strong thrombolytic,[5] comparable to aspirin[6] but without the potential side effects. It is important to note, however, that lumbrokinase is nearly 30 times more potent than nattokinase — and 300 times more potent than serrapeptase.[7,8,9]

So, while all of the fibrinolytic enzymes are effective and beneficial, you'll need much higher doses of nattokinase and, especially, serrapeptase, than lumbrokinase to achieve similar effects. If you are using a fibrinolytic enzyme, my strong personal preference and recommendation is to use lumbrokinase.

That said, you can get an idea of these enzymes' health potential via studies done on any of the types. One such study involved 1,062 people with mild hyperlipidemia and/or mild atherosclerosis. They took nattokinase at a dose of 10,800 fibrinolytic units (FU) a

day for 12 months, which "effectively managed the progression of atherosclerosis and hyperlipidemia with a significant improvement in the lipid profile."[10]

Significant reduction in carotid artery intima-media thickness, a measure of the extent of atherosclerotic vascular disease, was noted, with improvement rates ranging from 66.5% to 95.4%. Those who smoked, drank alcohol or had a higher BMI experienced the greatest lipid-lowering effects. No adverse effects were noted from the nattokinase.

It's also interesting to note that regular exercise further improved nattokinase's beneficial effects, and it also worked synergistically with consumption of vitamin K2 and aspirin. At a lower dose of 3,600 FU per day, nattokinase was ineffective at lowering lipids or suppressing the progression of atherosclerosis, highlighting the importance of proper dosing and "challenging the recommended dose of 2,000 FU per day," the researchers explained. Further:[11]

> *"The available data suggest that the antiatherosclerotic effects of NK are due to the collective effects of the combination of the antithrombotic, anticoagulant, antioxidant and lipid lowering properties of NK or the natto extract containing NK … A possible mechanism [for NK's lipid-lowering effects] is through NK proteolytic activity on certain protein targets involved in lipid metabolism, resulting in changes in lipid metabolism."*

A Single Dose of Fibrinolytics Has Anticoagulant Benefits

A study involving 12 men revealed that just one 2,000 FU dose of nattokinase enhanced fibrinolysis and anticoagulation.[12] It activated multiple fibrinolytic and antithrombotic pathways simultaneously, the researchers explained.[13] At six and eight hours after the nattokinase was taken, D-dimer concentrations were significantly elevated.

D-dimer is a protein fragment produced by the body when a blood clot dissolves. It's typically undetectable or present only at very low levels, buts its level may significantly rise when the body is forming and breaking down blood clots,[14] as occurred after one dose of nattokinase in this study. The researchers added:[15]

> *"Based on NK's unique, comparatively strong fibrinolytic/anticoagulant activity, stability in the gastrointestinal tract and long bioavailability in vivo, NK would appear to offer potential advantages over other currently used agents for treatment and/or prevention of selected diseases processes …*
>
> *NK might have an impact on not only fibrinolytic/anticoagulant pathways but also other risk factors for thrombosis, which imply as a NK's possibility for prevention and/or treatment of the diseases."*

As mentioned, fibrinolytic enzymes inhibit platelet aggregation and the formation of blood clots similarly to aspirin. In an animal study, a 500 mg/kg dose of nattokinase fully prevented a blocked artery, as did aspirin at a dose of 30 mg/kg, demonstrating its effectiveness at improving blood flow:[16]

> *"The results indicate that nattokinase extracted from fermented soybean inhibit platelet aggregation by blocking thromboxane [a vasoconstrictor] formation, and thereby delay thrombosis following oxidative arterial wall injury. Therefore, it is suggested that nattokinase could be a good candidate without adverse effects for the improvement of blood flow."*

Brain benefits are also apparent from fibrinolytic enzymes, including nattokinase and serrapeptase (SP). In a study on rats, administering either enzyme for 45 days successfully modulated several markers of Alzheimer's disease.[17] A significant increase in brain derived neurotropic factor (BDNF) was also noted. BDNF is a member of brain growth factors that contributes to neuroplasticity, which greatly enhances cognitive performance.[18,19]

Fibrinolytic Enzymes for COVID-19

Another candidate for application of fibrinolytic therapy is COVID-19, as coagulopathy appears to play a role in severe COVID-19. Researchers wrote in the Journal of Thrombosis and Haemostasis:[20]

"There is evidence in both animals and humans that fibrinolytic therapy in acute lung injury and acute respiratory distress syndrome (ARDS) improves survival, which also points to fibrin deposition in the pulmonary microvasculature as a contributory cause of ARDS.

This would be expected to be seen in patients with ARDS and concomitant diagnoses of DIC [disseminated intravascular coagulation] on their laboratory values such as what is observed in more than 70% of those who die of COVID-19."

The researchers reported three case studies of patients with severe COVID-19 respiratory failure who were treated with tissue plasminogen activator (TPA), a serine protease enzyme found on endothelial cells that's involved in fibrinolysis, or the breakdown of blood clots.[21]

All three patients benefited from the treatment, with partial pressure of oxygen/FiO2 (P/F) ratios, a measure of lung function, improving from 38% to 100%.[22] An evaluation of organ tissues from people who died from COVID-19 also revealed extensive lung damage, including clotting, and long-term persistence of virus cells in pneumocytes and endothelial cells.[23]

The findings indicate that virus-infected cells may persist for long periods inside the lungs, contributing to scar tissue. In an interview with Reuters, study co-author Mauro Giacca, a professor at King's College London, described "really vast destruction of the architecture of the lungs," with healthy tissue "almost completely substituted by scar tissue,"[24] which could be responsible for cases of "long COVID," in which symptoms persist for months.

"It could very well be envisaged that one of the reasons why there are cases of long COVID is because there is vast destruction of lung (tissue)," he told Reuters. "Even if someone recovers from COVID, the damage that is done could be massive."[25] Dissolving scar tissue is another area in which enzymes, particularly proteolytic enzymes, may be useful.

The potential for blood clots is one reason why board-certified internist and cardiologist Dr. Peter McCullough uses full-dose aspirin — 325 milligrams a day — in almost everyone with long COVID syndrome who doesn't have a major blood clot, in addition to other medications.[26]

However, a safer and likely equally effective alternative to aspirin is lumbrokinase and serrapeptase. You can alternate between the two enzymes — one day take lumbrokinase and the next take serrapeptase — because you'll need to be on it for about three months and you can develop a sensitivity to them over time if you use them daily without interruption.

A Breakdown of the Top Three Fibrinolytics

Fibrinolytic enzymes are ideal for targeted usage; as mentioned, if you intend to use them daily, be sure to alternate through the following types so you don't develop a sensitivity or allergy to them. Also, remember that they need to be taken on an empty stomach, at least one hour before or two hours after meals containing protein.

1. **Lumbrokinase —** As I said earlier, this enzyme is about 300 times stronger than serrapeptase and nearly 30 times stronger than nattokinase,[27] making it my top recommendation if you are using a fibrinolytic enzyme. Extracted from earthworms, lumbrokinase is a highly effective antithrombotic agent that reduces blood viscosity and platelet aggregation[28] while also degrading fibrin, which is a key factor in clot formation.

   I recommend that everyone keep some high-quality lumbrokinase in your emergency kit. I recently had a significant bruise from a weight training injury. I took a high dose of lumbrokinase for a week and it cleared right up.

   I also took lumbrokinase recently after being stung by three wasps on my forehead just before bed, which swelled to nearly the size of half a tennis ball. It occurred to me since wasp venom contains proteins that fibrinolytic enzymes can break down so I took half a dozen and went to sleep.

I was beyond surprised to see nearly all the swelling decrease. If you are going to try this the sooner you take it to the time you are bitten, the better it will likely work as it denatures the venom proteins before they do their damage to your body.

2. **Serrapeptase —** Also known as serratiopeptidase, serrapeptase is produced in the gut of newborn Bombyx mori silkworms, allowing them to dissolve and escape from their cocoons. Research has shown it can help patients with chronic airway disease, lessening viscosity of sputum and reducing coughing.[29] Serrapeptase also breaks down fibrin and helps dissolve dead or damaged tissue without harming healthy tissue.[30]

3. **Nattokinase —** Nattokinase has been shown to break down blood clots and reduce the risk of serious clotting[31] by dissolving excess fibrin in your blood vessels,[32] improving circulation and decreasing blood viscosity. Interestingly, in one in vitro study, the thrombolytic activity of equivalent amounts of nattokinase and TPA were found to be identical[33] — TPA, remember, is the enzyme that led to improvement in the three COVID-19 case studies.[34]