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Nattokinase: A potent fibrinolytic enzyme against cardiovascular diseases

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Nattokinase is a serine protease that can be extracted from a native Japanese food called “natto”. Natto can be produced by fermenting soybeans with the bacteria Bacillus subtilis. Nattokinase is encoded by the gene aprN. The aprN gene was first cloned and sequenced from Bacillus subtilis. Nattokinase has the capability of fibrinolysis and can be considered effective against the breakdown of blood clots. Animal and human trials have proven the fact that nattokinase helps in thinning of blood and dissolving blood clots, contributing to the efficient circulation of blood throughout the body. It hydrolyses fibrin and plasmin substrate followed by the conversion of endogenous prourokinase to urokinase, degrading plasminogen activator inhibitor-1 as well as increasing tissue plasminogen activator, which contributes to the fibrinolytic activity. The intra-duodenal absorption of nattokinase on oral administration brings about its fibrinolytic activity. In contrast to the other fibrinolytic proteases, nattokinase displays little to no adverse effects. Nattokinase is a natural enzyme used for the therapy of cardiovascular diseases. It is robust, cost-effective and has a positive impact on oxidative stress-mediated arterial thrombosis and inflammation-induced venous thrombosis.

On treating research subjects having oxidative thrombosis with nattokinase, formation of thrombi and aggregation of platelets are hindered. Nattokinase exhibits similar effects to that of aspirin. Contrary to aspirin, nattokinase does not cause bleeding, gastric ulcers or any other negative effects. It instead promotes improved blood flow. Studies have shown that after 12 hours of administration of nattokinase, increased levels of fibrin degradation product (FDP) fragments and D-dimers were detected in research subjects having inflammation-induced venous thrombosis. Increased levels of clotting factors VII and VIII are marked by the occurrence of cardiovascular disease due to their ability to activate a cascade of blood coagulation. Human trials have shown a significant decrease in the levels of factors VII and VIII along with fibrinogen after two months of regular administration of nattokinase. A single dosage of nattokinase has been found to cause the cleavage of the cross-linked fibrin leading to fibrinolysis. At present, nattokinase is being used as a natural supplement for blood thinning, inhibiting blood clots and promoting improved circulation of blood in many countries. In accordance with several studies, nattokinase is found to mitigate many other diseases, namely hypertension, Alzheimer’s disease, strokes and atherosclerosis.

Keywords: Nattokinase, Cardiovascular disease, Fibrinolysis, Thrombosis, Fibrin, Blood clot

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