Comment: Bromelain is an extract of the stems of pineapples that has anti-inflammatory activity. It also appears to increase the permeability and reduce the viscosity of inflammatory exudates, thereby promoting normal drainage and enhancing access of antibacterial agents (e.g., antibiotics, antibodies, and other components of the system) to the site of an infection. The results of this study indicate that bromelain can increase the response to conventional therapy in patients with sinusitis. In some studies of people with other types of infections, bromelain was beneficial even when administered without antibiotics.

The product used in this study was an enteric-coated preparation that is no longer commercially available. Most of the bromelain products currently on the market are not enteric-coated, so it is possible that a substantial proportion of the biological activity of these products is destroyed by gastric juices after oral administration. Ananase contained 20 mg of bromelain per tablet, whereas modern products usually contain substantially larger amounts. There is little or no published research on the effectiveness of non-enteric-coated bromelain products.


**Is sinusitis caused by allergy to fungus?**

Two hundred-ten consecutive patients with chronic sinusitis, of whom 101 were treated surgically, were studied. Fungal cultures of nasal secretions were positive in 202 (96%) of the patients. *Candida albicans* was cultured in 15.4% of patients, *Alternaria* in 44.3%, *Penicillium* in 43.3%, *Cladosporium* in 39%, and *Aspergillus spp.* in 29.5%; a wide range of other organisms were cultured less frequently. Allergic mucin (containing clusters or sheets of degenerating eosinophils) was found in 97 (98%) of the 101 surgical cases. Fungal elements (hyphae, destroyed hyphae, conidiae, and spores) were found histologically in 82 (81%) of the 101 surgical specimens. Allergic fungal sinusitis was diagnosed in 94 (93%) of the 101 surgical cases, based on histopathologic findings and culture results. An elevated IgE level to at least one fungal species was found in only 28% of 95 patients tested, and skin-prick tests were positive to at least one fungal allergen in only 25% of 179 patients tested.

Comment: Glutathione is a major antioxidant in lung tissue. Patients with cystic fibrosis have markedly decreased concentrations of total (oxidized plus reduced) glutathione in the epithelial lining fluid of the lung. Ancedotal reports suggest that nebulized glutathione administered by aerosol can relieve symptoms and improve clinical outcome in patients with chronic obstructive pulmonary disease. The results of the present study indicate that glutathione is also beneficial for the chronic lung disease that occurs in patients with cystic fibrosis.

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