

Serrapeptase Abstracts

Respirology. 2003 Sep;8(3):316-20.

Effect of the proteolytic enzyme serrapeptase in patients with chronic airway disease.

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OBJECTIVES: The proteolytic enzyme serrapeptase (SER) is widely used in clinical practice in Japan. We investigated the effect of SER on sputum properties and symptoms in patients with chronic airway diseases. **METHODS:** This study was an open-labelled trial with a non-treatment control group. Patients were randomly assigned to oral treatment with (n = 15) and without (n = 14) SER 30 mg/day for 4 weeks. Patients collected sputum samples for about 4 h in the morning on the day the trial began and 4 weeks later. We measured the amount of sputum by weighing. Part of each sputum sample was weighed and then completely dried and reweighed. The percentage solid component, viscosity and elasticity of the sputum were measured. Mucociliary transportability index was measured using ciliated bovine trachea ex vivo. Sputum smears were also prepared to count sputum neutrophils. Patients' symptoms were assessed by a questionnaire that used a visual analogue scale. **RESULTS:** After 4 weeks of SER treatment, sputum weight in the morning, percentage solid component, viscosity and elasticity of sputum, sputum neutrophil count, frequency of coughing and frequency of expectoration significantly decreased. The mean mucociliary transportability index increased from 13.3 +/- 1.8 to 24.4 +/- 2.5 (P = 0.0103).

CONCLUSIONS: SER may exert a beneficial effect on mucus clearance by reducing neutrophil numbers and altering the viscoelasticity of sputum in patients with chronic airway diseases.

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Serrapeptase Abstracts

Jpn J Antibiot. 1986 Mar;39(3):761-71.

Augmentation by serrapeptase of tissue permeation by cefotiam

Koyama A, Mori J, Tokuda H, Waku M, Anno H, Katayama T, Murakami K, Komatsu H, Hirata M, Arai T, et al.

Cefotiam (CTM) is a new cephalosporin with a broad spectrum of activity against both Gram-positive and Gram-negative microorganisms. Cephalosporins are widely used for prophylaxis of infections in patients undergoing thoracotomy. Augmentation by serrapeptase on tissue permeation of CTM was examined in 35 thoracotomy patients with lung cancer. The subjects were divided into two groups according to the method of the administration of CTM. Group I consisted of 17 subjects, each of whom received a single dose of 2 g of CTM alone by an instillation for 30 minutes. Group II consisted of 18 subjects, each of whom received a combination of CTM and serrapeptase; serrapeptase was given 2 tablets (10 mg) each time for three times/day until the day before surgery, and then CTM was administered by the same procedure. The following results were obtained: Individual difference was observed for the permeation of CTM into tissues. Pathologic differences also affected the permeation. Nevertheless, the CTM levels in pulmonary tissues reached about a half of those in the blood in both the single dose group and the combination group, hence sufficient concentrations exceeding MIC80 for main microorganisms that caused infections in the lung were obtained. The concentrations of CTM in inflammatory tissues have showed lower levels than those of normal tissues in both CTM single dose and the combination groups. Decrease of blood flow volume may have contributed to the reduction in levels of CTM in the inflammatory tissues. The ratio of the concentration of the drug in pulmonary tissues to that in the blood was 29.1 +/- 2.5% in the single dose group, and 44.2 +/- 6.0% in the combination group, the latter showing quite a significant increase (P less than 0.05). Combined administrations of CTM and serrapeptase deserves more trials in the case when surgical treatments of the lung are performed. An anti inflammatory effect of serrapeptase in the respiratory system is expected, and in addition, the combined use of CTM and serrapeptase should stimulate permeation of the antibiotic into tissues.

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Serrapeptase Abstracts

Pharmatherapeutica. 1984;3(8):526-30.

A multi-centre, double-blind study of serrapeptase versus placebo in post-antrotomy buccal swelling.

Tachibana M, Mizukoshi O, Harada Y, Kawamoto K, Nakai Y.

A multi-centre, double-blind, placebo-controlled trial was carried out to investigate the clinical efficacy of the anti-inflammatory enzyme serrapeptase in a total of 174 patients who underwent Caldwell-Luc antrotomy for chronic empyema. Eighty-eight patients received 10 mg serrapeptase 3 times on the day before operation, once on the night of the operation and 3 times daily for 5 days after operation; the other 86 received placebo. Changes in buccal swelling after operation were observed as a parameter of the response to treatment. The degree of swelling in the serrapeptase-treated patients was significantly less than that in the placebo-treated patients at every point of observation after operation up to the 5th day (p less than 0.01 to p less than 0.05). Maximal swelling throughout all the post-operative points of observation was also significantly smaller in size in the serrapeptase-treated group than in the placebo-treated group. No side-effects were reported.

Publication Types:

Clinical Trial

Randomized Controlled Trial

PMID: 6366808 [PubMed - indexed for MEDLINE]



Serrapeptase Abstracts

Jpn J Antibiot. 1983 Oct;36(10):2665-70.

Experimental studies on distribution of cefotiam, a new beta-lactam antibiotic, in the lung and trachea of rabbits. II. Combined effects with serratiopeptidase

Ishihara Y, Kitamura S, Takaku F.

Plasma levels and distribution in pulmonary and bronchial tissues of CTM following injection into the jugular vein were investigated in rabbits with experimental pleuritis or pneumonitis as well as in normal rabbits. The experiments also included the assessment of the effect of concomitant administration of serratiopeptidase (TSP). The pneumonitis + TSP group, pleuritis group and pleuritis + TSP group showed a tendency to delayed dissipation of CTM from the plasma, as compared with controls. The CTM concentrations in tissues from the apical region of upper lobe (L1), lateral region of middle lobe (L2) and diaphragmatic region of lower lobe (L3) 30 minutes after injection did not differ significantly between the control and the TSP group, pleuritis group or pleuritis + TSP group. In the pneumonitis group, the tissue CTM concentrations at all 3 sites (L1, L2, L3) were lower than those in the control group. They were increased by the concomitant administration of TSP, with statistical significance of increase in regions L2 and L3. Thirty minutes after the injection of CTM, the pneumonitis group and pneumonitis + TSP group displayed essentially comparable CTM levels in pleural fluid, whereas the CTM concentrations in the pleural fluid were prone to be increased in the pleuritis + TSP group as comparing with the pleuritis group. CTM levels in the tissues of trachea (B0), right and left main bronchi (B1) and lobar bronchi (B2) 30 minutes after the injection did not show any significant difference between control and TSP-treated normal groups. CTM concentrations tended to be increased, yet not significantly, in all these regions in the rabbits with pleuritis administered TSP, compared to those without TSP.(ABSTRACT TRUNCATED AT 250 WORDS)

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Serrapeptase Abstracts

Biorheology. 1983;20(5):677-83.

Effect of expectorants on relaxation behavior of sputum viscoelasticity in vivo.

Shimura S, Okubo T, Maeda S, Aoki T, Tomioka M, Shindo Y, Takishima T, Umeya K.

We studied the effects of expectorants (mucolytic agents) in vivo on the relaxation behavior of sputum viscoelasticity. Seven female and thirty-three male patients (56.8 +/- 19.3 yrs, range: 21 to 82 years old) with a chronic pulmonary disease except bronchial asthma were studied. They were randomly put into the control group or a group which would be given oral treatments with an expectorant for a week after a one week washout period. The groups were as follows: Group I (n = 8), control; Group II (n = 7), Bromhexine hydrochloride 24 mg per day; Group III (n = 10), Ambroxol 90 mg per day; Group IV (n = 9) alpha - Chymotrypsin buccle 100 ch.u. per day; Group V (n = 6), Serratiopeptidase 30 mg per day. In Groups IV & V, frequency dependence of sputum viscoelasticity at the range of $\omega = 10^{-3}$ to 10^0 rad.sec⁻¹ were clearly changed after the treatments, and the magnitude of the relaxation and its main relaxation time were significantly increased. On the other hand, in Groups I, II & III, no significant changes of the frequency dependences were observed. These findings suggest that proteolytic enzymes administered orally work on the molecular structure of sputum, and break down their linkages between subunits of the structure.

Publication Types:

Clinical Trial

Randomized Controlled Trial

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Serrapeptase Abstracts

Arzneimittelforschung. 1982;32(4):374-8.

A new method for evaluating mucolytic expectorant activity and its application. II. Application to two proteolytic enzymes, serratiopeptidase and seaprose.

Kase Y, Seo H, Oyama Y, Sakata M, Tomoda K, Takahama K, Hitoshi T, Okano Y, Miyata T.

Using our new method described in a preceding paper, in vivo effects of two proteolytic enzymes such as serratiopeptidase (SER) and seaprose (SAP) on sputa collected from bronchitis rabbits were examined. SER (20 mg/kg) and SAP (30 mg/kg) significantly reduced the viscosity of sputum (P less than 0.05) at the 1-3-h periods and the 4-6-h periods, respectively, after intraduodenal administration. 50 mg/kg of SER also significantly decreased not only viscosity (P less than 0.001) but also amount of freeze-dried substance (P less than 0.05) of sputum at the 1-3-h periods, but SAP did not affect the amount of dried substance. Both enzymes significantly increased the volume of sputum, probably as the result of liquefaction. Thus, mucolytic expectorant activity of both enzymes can be demonstrated first by the reduction in viscosity and next of the increase in volume of sputa. However, the decrease in amount of freeze-dried substance is not always in accord with the reduction viscosity.

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