Dig Dis Sci 1999 Aug;44(8 Suppl):87S-93S

Stress-induced rat intestinal mast cell intragranular activation and inhibitory effect of sulfated proteoglycans.

Theoharides TC, Letourneau R, Patra P, Hesse L, Pang X, Boucher W, Mompoint C,Harrington B

Department of Pharmacology and Experimental Therapeutics, Tufts UniversitySchool of Medicine, Boston, MA 02111, USA.

Cyclic vomiting syndrome is characterized by sudden episodes of vomiting and abdominal pain. It occurs primarily in children, is exacerbated by stress, and is often considered a migraine equivalent. Migraines have been linked to mast cells, which are often found close to neurons where they are activated byneuropeptides. We investigated the ultra structural appearance of rat ileal brushborder and mast cells following acute stress by immobilization. The effect of sulfated proteoglycans heparin and chondroitin sulfate was also tested on mast cell histamine secretion. Ileal brush border appeared intact in control animals, but was shorter and exhibited intercellular gaps after 30 min of acute immobilization stress. Mast cell activation in control rats was minimal, while stress induced obvious signs of activation as judged from disappearance ofsecretory granule electron dense contents. However, these intragranular changes were not accompanied by typical degranulation through exocytosis. Treatment of purified homogeneic rat peritoneal mast cells with 10(-4) M heparin orchondroitin sulfate 30 min prior to stimulation with 0.5 microg/ml compound48/80 decreased histamine release by over 70% and 50% ($P < 0.05$), respectively.These results suggest the possible usefulness of chondroitin sulfate in conditions such as cyclic vomiting syndrome.

PMID: 10490045