Role of basic fibroblast growth factor in the healing of gastric ulcer in rats

Hiroshi Satoh

Department of Veterinary Pharmacology,
Faculty of Agriculture,
Tottori University, Tottori 680, Japan

Recently, it has been pointed out that growth factors play an important role in the healing of gastrointestinal ulcers. In the present study, role of basic fibroblast growth factor (bFGF) in the healing and relapse of gastric ulcers was examined in the male SD rats. Gastric ulcers were induced by injection of acetic acid into the subserosal layer of the antrum and relapse of the ulcer was caused by s.c. administration of indomethacin for 2 weeks starting 4 weeks after the ulcer formation.

The content of bFGF in the ulcerated area increased with time as the ulcer healed and reached maximum 7 days after ulcer formation. In the gastric ulcer bed, many cells such as fibroblasts and macrophages were positively stained immunohistochemically by anti-bFGF antiserum. A monoclonal antibody for bFGF (MAb 3H3, 0.1 mg/kg/day, i.v.) inhibited the number of microvessels in the ulcer bed and significantly delayed ulcer healing, while bFGF mutein (TGP-580, 0.1 mg/kg, x2/day, p.o.) increased the number of microvessels in the ulcer bed and accelerated the healing. The relapse of ulcers was significantly inhibited by pretreatment for 4 weeks with TGP-580 (0.1 mg/kg/day, p.o.) and mildly inhibited by cimetidine (100 mg/kg, p.o.) but not by ranitidine (100 mg/kg, p.o.). When the drugs were co-administered with indomethacin for 2 weeks, the relapse was significantly prevented by ranitidine and mildly by cimetidine and TGP-580.

These results suggest that 1) endogenous bFGF may play an important role in the healing of gastric ulcers in the rat and the angiogenic properties of bFGF (TGP-580) may be involved in its effect on ulcer healing, 2) both TGP-580 and histamine H_2-receptor antagonists (H_2-RAs) can prevent the ulcer relapse induced by indomethacin but via different modes of action: TGP-580 inhibits relapse mainly by acting on the process of ulcer healing, while H_2-RAs act mainly on the process of ulcer aggravation.

References

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