Fibrin glue, healing of gastric mucosal injury, and expression of growth factors: Results from a human in vivo study.

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Abstract:

Background: Fibrin glue is used in the endoscopic therapy of bleeding ulcerations. Accelerated closure of ulcers has been attributed to this treatment; the biologic reason, however, remains unclear. Methods: Two artificial gastric lesions were induced in healthy, Helicobacter pylori negative volunteers and were treated by injection of either saline solution or fibrin glue. After 72 hours, resulting ulcers were measured and biopsy specimens were taken for immunohistochemistry (to identify proliferating cells and small vessels) and assessment of growth factor messenger RNA (mRNA) expression (platelet derived growth factor, vascular endothelial growth factor, fibroblast growth factor 2 [FGF-2]) by real-time reverse transcriptase-polymerase chain reaction (RT-PCR). Results: After 72 hours, most lesions exposed to fibrin glue were smaller than the corresponding ones treated with saline solution. The ulcer rim was more pronounced; immunohistochemistry revealed more proliferating cells ($p < 0.02$ compared with saline solution). The number of microvessels also increased, though this difference did not reach statistical significance ($p = 0.10$). FGF-2 mRNA expression markedly increased (about 7-fold compared with the control [$p < 0.001$], and about 5-fold compared with saline solution [$p < 0.015$]); whereas, with respect to platelet derived growth factor and vascular endothelial growth factor mRNAs, only small changes occurred. Conclusions: Fibrin glue positively modulates gastric ulcer healing by causing an increase in the number of proliferating cells in the ulcer margin and also possibly enhances the density of microvessels. These changes are accompanied by an enhanced expression of FGF-2, which is known to exert beneficial effects on ulcer healing.

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