The effect of TGF-beta2 in various vehicles on incisional wound healing.

Authors: Wright T.E., Hill D.P., Ko F., Soler P.M., Smith P.D., Franz M., Nichols E.H., Robson M.C.

Publication Date: 2000

Abstract:

BACKGROUND: The isoforms of transforming growth factor beta (TGF-beta) have been shown to be deficient in models of impaired wound healing. Exogenous application of the growth factor to enhance healing as been investigated. TGF-beta1 has been shown to enhance incisional wound strength, but to be dependent on the vehicle used to carry the cytokine. Because TGF-beta2 has shown safety in human trials of chronic wound healing, this study evaluates TGF-beta2 in acute incisional healing using a variety of vehicles. METHODS: Using an acute incisional wound model in healthy rats, rhTGF-beta2 was suspended in various vehicles including fibrin sealant (normal commercial concentration), fibrin sealant (dilute concentration), phosphate buffered saline/serum albumin, and a carboxymethycellulose gel. A single dose of the agent was instilled into the incisions at the time of wound closure and breaking strength analyses and histology performed periodically from days 3-14. RESULTS: TGF-beta2 enhanced the gain of incisional strength in all vehicles during the first two weeks of healing. This was most noticeable by day three with the carboxymethycellulose gel, but by day 7 with the other vehicles. Like reports with TGF-beta1, TGF-beta2 accelerated the gain of wound strength by about three days by day 11. Normal density fibrin sealant delayed incisional healing; whereas, the other vehicles without TGF-beta2 had no significant effect. CONCLUSIONS: The use of TGF-beta2 appears to be of value in increasing incisional wound strength in the first 14 days post-wounding in healthy rats and this effect is demonstrated in a variety of vehicles. These data support the hypothesis that the "normal" incisional wound healing curve can he shifted to the left. Shortening the time for gain of incisional wound

strength may have potential clinical use.