

Kloth, et al. 1999. Effect of pulsed radio frequency stimulation on wound healing: A double-blind pilot clinical study. In: Electricity and Magnetism in Biology and Medicine, F Bersani, ed. Plenum, NY, 1999, pp. 875-878.

Purpose: This double-blind, placebo-controlled, prospective clinical pilot study was aimed at determining the effect of pulsed radio frequency (PEMF) stimulation on the healing of chronic wounds in spinal cord injured patients. Based on other reports that invasively applied electric currents accelerate wound healing⁴⁻⁶, it was hypothesized that an electric current having similar parameters induced non-invasively into wound tissues by a radio frequency electromagnetic field would have a similar effect.

Methods: In this double-blind, placebo-controlled pilot study the goal was to determine the effect of PEMF treatment on healing of pressure ulcers in spinal cord injured patients. Two groups of five male patients with pressure ulcers were enrolled in the study. The ulcers of one group were treated with an active PEMF device for 30 minutes, Monday through Friday for four consecutive weeks. Ulcers of the second group were treated with a sham PEMF device for 20 days over the same time period. Both groups received a standard saline moist gauze dressing to their wounds between daily treatments. A baseline tracing of each patient's wound opening was made and four subsequent tracings were made at weekly intervals. Tracings were digitized by computer to determine wound area dimensions in cm².

Results: Comparison of the wound area prior to the start of PEMF treatment revealed that initial mean wound opening area was not significantly different for the PEMF sham and active groups. In contrast, after 4 weeks of PEMF therapy, wounds treated with PEMF were $64 \pm 15\%$ healed (wound closure) vs $-8 \pm 24\%$, or no change i.e., wound progression was identical to that prior to study entry, in the sham treated group, $P = 0.016$.

The results from this study substantiate those from a double-blind study using a similar PEMF signal on pressure ulcers in the same patient population⁸. Although the number of patients treated with PEMF was small, the results obtained in this pilot study suggest that RF therapy may be beneficial as an adjunct treatment for chronic wounds. Certainly the results are similar to those obtained with high voltage pulsed current⁴⁻⁶, with the added clinical advantage of a non-contact application and dosimetry relatively independent of the wound state.