

Pilla, A., et al. 1996. Effect of pulsed radiofrequency therapy on edema from grades I and II ankle sprains: a placebo controlled, randomized, multi-site, double-blind clinical study. *J Athl Train* S31:53.

Purpose: To determine the effect of PEMF therapy on edema volume in a ankle sprain injury. PEMF therapy was provided in a double-blind, placebo-controlled fashion, in addition to standard treatment (rest, elevation, compression, cryotherapy), for Grades I and II lateral ankle sprains. This prospective study was conducted at 14 clinical sites within the U.S.

Methods: Patients who experienced a lateral ankle sprain (Grade I or II) and could receive the first PEMF treatment within 48 hours were eligible for participation in this study. Patients enrolled were randomly divided into treatment (PEMF) and sham treatment (control) groups. Patients received a single 30 minute treatment on Day 1 and Day 2 after study entry. Swelling was measured before and after each treatment session and on Day 3. Edema volume of the injured ankle (ml) was measured by the water displacement method both before and after treatment.

Results: This study recruited 439 subjects at fourteen centers. Of this total, 395 patients completed the protocol, 193 in the control and 202 in the active groups, respectively. The difference of Day 3 to Day 1 edema volume measurements, as well as the rate of edema volume change over the same period, were evaluated for all patients, and the means for the active and control groups were compared. Edema decrease in the PEMF treated group ($\bar{x} \pm s$]12.0 \pm 4.1 ml) was approximately 7x greater than that in the control (sham treated) group ($\bar{x} \pm s$]1.6 \pm 3.6 ml), $P=.03$ (see figure 2, left). These results suggest edema was basically unchanged in the control group, whereas a significant reduction of edema volume was observed for the group exposed to PEMF therapy over the treatment and observation period. The mean rate of edema decrease (indicative of time in inflammatory phase) for this period in the PEMF treated group ($\bar{x} \pm s$]5.8 \pm 2.1 ml/day) was nearly 5x that in the sham treated group ($\bar{x} \pm s$]1.2 \pm 1.8 ml/day), $P<0.05$ (see figure 2, right). This again suggests the rate of edema change was not significantly different from zero in the control group, while a large edema decrease could be expected in the active group.

Conclusions: PEMF has a significant, additive effect on edema in ankle injury.