Effects of High Voltage Pulsed Current on Recovery Following Grade I and II Lateral Ankle Sprains

Dolan MG*, Mendel FC†, Fish DR†, Marzo JM†, Wilding GE†:
*Canisius College, †University at Buffalo, Buffalo, NY

Context: Ankle sprains are the most common injury in intercollegiate athletics, and result in significant time loss from practices and games. High voltage pulsed current (HVPC), a form of electrical stimulation, is known to curb edema formation in animals, and is commonly applied to ankle sprains in the belief that HVPC hastens recovery. Clinical effect(s), however, remain(s) undocumented. **Objective:** Determine whether, as an adjunct to routine acute and subacute care, subsensory HVPC applied nearly continuously for the first 72 hrs following lateral ankle sprains affected time lost to injury. **Design:** Multi-center, randomized, double blind, placebo controlled trial. **Setting:** Data were collected at nine colleges/universities, and one professional football training site. **Patients or other Participants:** 50 intercollegiate and professional athletes, 32 males, 18 females, age=20.0±1.54 years, BMI=24.9±3.9. **Interventions:** As soon after injury as practically possible near-continuous live (n=22) or placebo subsensory HVPC (n=28) was applied for 72 hours post injury adjunctive to routine acute and subacute care. HVPC (cathodal, 120 pulses per second) was delivered by miniature stimulators via sock electrodes. ‘Placebo' stimulators provided this same output, but for just 3 minutes after the final intensity settings were entered. Units appeared to be active regardless of actual output, and ‘reactivated' with any adjustment of amplitude. Subjects, data collectors, and investigators remained blind to group assignment until after the study concluded. Statistical analysis of the primary outcome (time from injury to time declared fit to play) was conducted using inference procedures based on a linear model fit to the data via restricted maximum likelihood methods. Specifically, the outcome was modeled as a function of treatment, grade of injury, and the interaction between the two to allow for grade specific effects of treatment. **Main Outcome Measure:** Time lost to injury, measured from time of injury until declared fit to play by supervising athletic trainers or team physicians. **Results:** Overall, time lost to injury was not different between treated and control groups (p = .55). However, grade of injury was a significant factor; time lost to injury following grade I lateral ankle sprains was greater for athletes receiving live HVPC (5.3±1.9 days) than for those receiving placebo HVPC (4.1±1.3 days, p = .049). However, we found no differences between groups for grade II sprains (live=12.6±6.1 days, placebo=13.9±7.0 days, p=.079). **Conclusions:** Application of subsensory HVPC, as applied in this randomized clinical trial, had no clinically meaningful effect on return to play following lateral ankle sprains in college and professional athletes. **Word Count:** 405