Expedited Wound Healing with Noncontact, Low-Frequency Ultrasound Therapy in Chronic Wounds: A Retrospective Analysis

Reference:

Scientific Literature Review

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Podiatric Relevance:
Healing chronic wounds is a constant challenge for podiatrists. This article evaluates to the clinical role of noncontact, low frequency ultrasound therapy (MIST Therapy) in the treatment of chronic lower extremity wounds.

Methods:
A retrospective study was conducted evaluating patient records at the Gonda Vascular Center Ulcer Healing Clinic at the Mayo Clinic from January 2005 to March 2007 with below-knee lower extremity wounds. Healing outcomes were compared for 163 patients who received MIST therapy with standard of care to 47 patients in the control group receiving standard of care alone over a 6 month period. Wounds were primarily assessed by proportion of wound healed, wound volume reduction, and rate of healing. Standard of care consists of wound care as appropriate to case including debridement, moist dressings, and advanced dressings as well as etiology-specific care. Criteria for MIST therapy included MIST therapy administration 3 times per week for 90 days or until healed. MIST therapy is a compact portable device that delivers 0.1-0.8 W/cm³ intensity, 40kHz ultrasound energy via atomized sterile saline mist.

Results:
Of the 210 patients, the MIST treatment group and control group were well matched on the demographic and clinical characteristics collected. 53% of the treatment group healed over an average of 147 days compared to 32% of control group in 134 days (p=.009), although when evaluated by wound etiology this was only significant in wounds of venous origin. Percentage of mean wound volume reduction was greater in wounds treated with MIST therapy during the study period. Median volume for control group started at 368mm³ and decreased to end volume of 68 mm³, versus MIST median start volume of 304 mm³ with wound end of 0 mm³. However, mean volume reduction in neuropathic wounds was greater in control group. Lastly, the rate of healing as seen by the function of volume over time, the MIST slope of 1.4 indicates a faster rate than the control of .22 (p=.002).

Conclusions:
The concurrent use of MIST therapy and standard of care appear to expedite wound healing. As an adjuvant intervention for wound healing, MIST therapy prepares the wound bed for healing by reducing bioburden, enhancing angiogenesis, assisting in debridement of necrotic and devitalized tissues, and stimulating cellular activity. Further research should be done to evaluate the clinical benefits in specific wound types.