

Phototherapy Improves Healing of Chronic Venous Ulcers

Kelly Steinkopf Caetano, Marco Andrey Cipriani Frade, Débora Garbin Minatel, Luisiane Ávila Santana and Chukuka S. Enwemeka.

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Abstract

Objective: We tested the hypothesis that LED phototherapy with combined 660-nm and 890-nm light will promote healing of venous ulcers that failed to respond to other forms of treatment.

Background Data: A variety of dressings, growth factors, and adjunct therapies are used to treat venous ulcers, but none seems to yield satisfactory results.

Materials and Methods: We used a randomized placebo-controlled double-blind study to compare a total of 20 patients divided with 32 chronic ulcers into three groups. In group 1 the ulcers were cleaned, dressed with 1% silver sulfadiazine (SDZ) cream, and treated with placebo phototherapy ($<.03 \text{ J/cm}^{-3}$) using a Dynatron Solaris 705[®] phototherapy research device. In group 2 the ulcers were treated similarly but received real phototherapy (3 J/cm^{-2}) instead of placebo. In group 3 (controls), the ulcers were simply cleaned and dressed with SDZ without phototherapy. The ulcers were evaluated with digital photography and computer image analysis over 90 d or until full healing was attained.

Results: Ulcers treated with phototherapy healed significantly faster than controls when compared at day 30 ($p \pm 0.01$), day 60 ($p \pm 0.05$), and day 90 ($p \pm 0.001$), and similarly healed faster than the placebo-treated ulcers at days 30 and 90 ($p \pm 0.01$), but not at day 60. The beneficial effect of phototherapy was more pronounced when the confounding effect of small-sized ulcers was removed from the analysis. Medium- and large-sized ulcers healed significantly faster with treatment ($\geq 40\%$ rate of healing per month) than placebo or control ulcers ($p \pm 0.05$).

Conclusion: Phototherapy promotes healing of chronic venous ulcers, particularly large recalcitrant ulcers that do not respond to conventional treatment.