

## Safety and Efficacy of Mild Compression (18–25 mm Hg) Therapy in Patients with Diabetes and Lower Extremity Edema

Stephanie C. Wu, D.P.M., M.S.,<sup>1</sup> Ryan T. Crews, M.S.,<sup>1</sup> Bijan Najafi, Ph.D.,<sup>1</sup>  
Nancy Slone-Rivera, ANP-C,<sup>1</sup> Jessica L. Minder, B.S.,<sup>1</sup> and Charles A. Andersen, M.D.<sup>2</sup>

### Abstract

#### Background:

Patients with diabetes often present with lower extremity (LE) edema; however, because of concomitant peripheral arterial disease, compression therapy is generally avoided by providers in fear of compromising arterial circulation. This pilot study sought to assess whether diabetic socks with mild compression (18–25 mm Hg) can reduce LE edema in patients with diabetes without negatively impacting vascularity.

#### Methods:

Eighteen subjects (9 males, 9 females) aged  $61 \pm 11$  years with diabetes, LE edema, and a mean ankle–brachial index (ABI) of  $1.10 \pm 0.21$  successfully completed this uncontrolled study. At baseline, subjects were fitted and instructed to wear the socks during all waking hours. Follow-up visits occurred weekly for four consecutive weeks. Edema was quantified through midfoot, ankle, and calf circumferences and cutaneous fluid measurements. Vascular status was tracked via ABI.

#### Results:

Repeated measures analysis of variance and least significant difference *post hoc* analyses were used for data analyses. Calf circumferences showed a statistically significant ( $p < .05$ ) decrease of  $1.3 \pm 0.28$  cm after just one week and remained significantly smaller than baseline throughout the study. Foot circumferences were significantly reduced at week 2 ( $-0.98 \pm 0.35$  cm) and remained significantly below baseline for the remainder of the study. The ankle also demonstrated a trend of circumference reduction but was not statistically significant. Cutaneous edema significantly reduced by week 3 ( $-3.1 \pm 1.3$  U) and remained so at week 4. Ankle–brachial index significantly increased ( $0.14 \pm 0.049$ ) at week 2 but was not significantly higher at weeks 3 or 4. No adverse events occurred during the study.

#### Conclusions:

Mild compression therapy (18–25 mm Hg) decreased swelling in diabetes patients with LE edema without compromising vascularity.

*J Diabetes Sci Technol* 2012;6(3):641–647

**Author Affiliations:** <sup>1</sup>Scholl's Center for Lower Extremity Ambulatory Research at Rosalind Franklin University, North Chicago, Illinois; and <sup>2</sup>Madigan Health Care System, Tacoma, Washington

**Abbreviations:** (ABI) ankle–brachial index, (ANOVA) analysis of variance, (BMI) body mass index, (CI) confidence interval, (LE) lower extremity, (PAD) peripheral arterial disease, (VPT) vibration perception threshold

**Keywords:** compression, diabetes, edema, lower extremity

**Corresponding Author:** Stephanie Wu, D.P.M., M.Sc., Center for Lower Extremity Ambulatory Research, Dr. William M. Scholl College of Podiatric Medicine at Rosalind Franklin University of Medicine and Science, 3333 Green Bay Rd., North Chicago, IL 60064; email address [stephanie.wu@rosalindfranklin.edu](mailto:stephanie.wu@rosalindfranklin.edu)