THE EFFECTS OF CONTRAST BATHS ON SKIN BLOOD FLOW IN PEOPLE WITH TYPE 2 DIABETES AND AGE MATCHED CONTROLS.

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Purpose: To reduce muscle spasms, inflammation, and wound healing times, contrast baths (or the alterations of hot and cold whirlpool immersions) can be utilized. The purpose of this study was to investigate the effectiveness of contrast baths in altering limb blood flow in people with type 2 diabetes versus control subjects. It was hypothesized that diabetic subjects would experience less of a beneficial increase in blood flow than controls. The efficacy of a second contrast bath protocol (6 minutes hot and 2 minutes cold) was also examined. Methods: This study involved 14 type 2 diabetics (age 47±9 years, height 174.0±11.6 cm, weight 88.9±12.4 kg) and 14 age-matched controls (age 44±8 years, height 176.1±15.2 cm, weight 83.2±10.3 kg). The contrast bath protocols included four cycles of 3 minutes hot and 1 minute cold (3:1), two cycles of 6 minutes hot and 2 minutes cold (6:2), 15 minutes of cold water immersion, and 15 minutes of hot water immersion. Water for the hot and cold baths were obtained from separate whirlpools maintained at 37.8°C and 15.5°C, respectfully. Blood flow was measured on the dorsal aspect of a single foot during the four protocols utilizing a Laser Doppler Flow meter. The data was collected by a MP 100 Biopac System and analyzed using Acknowledge 3.8.3 software. Data values were compared using ANOVA repeated measures. P values <0.05 were considered statistically significant. Results: Control subjects experienced a significant increase in dorsal pedal blood flow following implementation of the 3:1 protocol (p<0.05). Diabetic subjects did not experience such significant changes (p>0.05). The 6:2 protocol significantly changed dorsal pedal blood flow in control subjects (p<0.05) but not in diabetic subjects (p>0.05). In control subjects, the 6:2 protocol proved to be less effective at increasing dorsal pedal blood flow than the 3:1 protocol (p<0.05). Conclusions: Diabetic subjects did not experience a significant increase in dorsal pedal blood flow during contrast bath therapy. This was likely due to vascular endothelial cell damage. Although the 6:2 protocol improved blood flow in control subjects, it was not as effective as the 3:1 protocol. Such findings support the ability of multiple-cycle contrast baths to increase blood flow versus constant temperature baths.