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Effects of Far-Infrared Therapy on Foot Circulation Among Hemodialysis Patients With Diabetes Mellitus

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Abstract

Background: Far-infrared radiation (FIR) therapy improves vessel dilation, circulation, vessel endothelial function, and angiogenesis and reduces atherosclerosis. However, evidence of FIR therapy's effects on foot circulation among diabetic patients undergoing hemodialysis is scarce.

Aim: To determine whether FIR therapy improves foot circulation in diabetic patients undergoing hemodialysis.

Design: Quasi-experimental.

Methods: In June to November 2017, diabetic patients undergoing hemodialysis ($N = 58$) at a hemodialysis center in northern Taiwan were divided into two groups: the experimental group ($n = 31$)

received FIR therapy to the bilateral dorsalis pedis artery (40 min/session, 3 times/week for 6 months) and the control group ($n = 27$) received conventional dialysis care. Paired t test, independent samples t test, two-proportion Z test, and repeated-measures analysis of covariance were performed to compare changes from baseline to the end of the 6-month intervention between the groups.

Results: Significant positive effects of FIR therapy on temperature, pulse, and blood flow of the dorsalis pedis artery were observed. Sensitivity to pain, tactility, and pressure also improved significantly in the experimental group. The Edinburgh Claudication Questionnaire revealed that the experimental group had reductions in subjective experiences of soreness, tingling, and coldness in the feet.

Conclusion: The findings of significant improvements to objective and subjective measures of blood flow and neural function in the experimental group indicate that FIR therapy improves blood circulation to the feet. This therapy thus has great potential to be an effective adjuvant treatment for patients with diabetes mellitus undergoing hemodialysis.

Keywords: diabetic hemodialysis; far-infrared therapy; foot circulation.

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