



Quality of Life

Photobiomodulation therapy in diabetes: Benefits for pain relief, quality of life, and wound healing

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Abstract

Globally, 537 million people suffer from diabetes mellitus (DM), a condition often associated with sensory disturbances, wound development, and chronic pain, which significantly affects the quality of life and imposes a substantial economic burden. This study evaluated the effects of photobiomodulation (PBM) therapy on nociceptive and sensory changes in diabetic patients to understand pain manifestations and explore PBM's molecular mechanisms on wound healing. Twenty patients with type 2 DM underwent clinical assessments, completed pain and quality of life questionnaires, and had their pain sensitivity evaluated using the quantitative sensory test (QST). A 5 mm skin biopsy was taken for fibroblast culture. PBM therapy, using 660 nm red light, was administered twice weekly for 7 weeks on lower limb wounds. Results indicated that DM patients faced significant sensory impairments, impacting their quality of life. PBM therapy improved pain scores, alleviated neuropathic pain, and enhanced sensory function, leading to better quality of life and reduced anxiety and depression. It also accelerated wound healing, enhancing mobility and autonomy. In vitro studies showed PBM therapy increased cell proliferation through the ERK signaling pathway and modulation of matrix metalloproteinases (MMP-1/8 and 2) and tissue inhibitors of metalloproteinases (TIMP).

Keywords

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