

5th World Congress on Diabetes & Metabolism

November 03-05, 2014 Embassy Suites Las Vegas, USA

Laser therapy speeds up healing of chronic diabetic ulcers

Nicolette N Houreld

University of Johannesburg, South Africa

Diabetes is the leading cause for non-traumatic amputations and hospitalization. Current treatments are challenging, lengthy, costly and associated with failure to heal and relapse. In recent years emphasis has been directed at using low level laser therapy (LLLT), or phototherapy, to accentuate cellular processes to contribute to more efficient resolution of wound healing. This study aimed to determine the effects of laser irradiation on diabetic wound healing. An *in vitro* diabetic wound model was irradiated with visible red (636 or 632.8 nm) and near infra-red (830 nm) light at a fluence of 5 J/cm². Various cellular and molecular events were evaluated post-irradiation. A pilot study was also conducted on chronic ulcers in diabetic patients using a combination of red and infra-red light. Patients were treated twice a week for a maximum of 12 weeks with standard podiatric care and phototherapy. *In vitro* studies showed that laser irradiation stimulated cellular viability and proliferation, and increased collagen production. Treating patients with LLLT in combination with standard treatment of care was advantageous over treating ulcers with podiatric methods alone, and some ulcers resolved completely within 8 weeks. It is evident that a combination of conventional podiatric intervention and phototherapy has the ability to improve wound regeneration. Phototherapy can be an important tool in speeding up the healing process as well as alleviating pain and inflammation. There is a need to study the underlying mechanisms involved in LLLT so that this form of therapy, which has no reported side-effects, can be used as an adjunctive therapy for the treatment of diabetic ulcers.

Biography

Nicolette N Houreld, D.Tech (UJ) Biomedical Technology, is a full time senior Lecturer and Researcher in the Laser Research Centre, Faculty of Health Sciences, University of Johannesburg. As a NRF (National Research Foundation, South Africa) Y2-rated (young) Scientist, her field of research is laser tissue interaction and focuses on the biochemistry and molecular effects of lasers used in therapy, particularly in diabetic wound healing. She has numerous accredited publications and serves on various research-related university and science council committees, executive committees including the World Association for Laser Therapy, and the editorial board of internationally accredited journals.

nhoureld@uj.ac.za