

Carbon dioxide laser treatment for hypertrophic burns scarring: interim results from the Western Australia Burns Service.

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Introduction: Ablative fractional carbon-dioxide laser (CO₂AFL) is a promising treatment of hypertrophic scarring (HS). However, there is no supporting level-one evidence. The WA Burns Service initiated a prospective RCT to evaluate CO₂AFL in HS treatment.

Hypothesis: CO₂AFL induces measurable improvement in clinical scar outcomes – induced by thermal modulation of HS tissue.

Aims: To determine efficacy of CO₂AFL on clinical outcomes of HS versus standard scar therapy. Furthermore, to correlate clinical changes with changes in histological morphology of treated HS.

Methods: Participants with a 10x10cm area of confluent scar were recruited. This area was divided randomly into two zones, one zone was randomised to three treatment interventions (10,600nm 'Ultrapulse' CO₂AFL (Lumenis) with settings of 50mJ and 5% density), the other received standard care. Clinical outcomes included VSS, POSAS, Dermalab Combo®, Semmes-Weinstein testing and standardised photography.

Biopsies were taken from both control and treated halves. Assessment of collagen orientation was performed using fast-fourier transform (FFT) analysis of picrosirius-red stained sections. Vascular and inflammatory responses were characterised on H&E staining.

Results: All recruited patients showed improvement in VSS, POSAS and sensation. At interim analysis, no significant difference between zones was detected. However, a trend towards increased pliability of treated zones was observed.

FFT demonstrated significant change ($p=0.0371$) in deep-dermis of treated biopsies. H&E staining showed inflammatory change in treated biopsies taken acutely post-treatment and at final follow-up.

Conclusions: Interim results demonstrate significant improvement in deep-dermal collagen orientation post-CO₂AFL. Recruitment continues, however initial results suggest a correlation between CO₂AFL and improved pliability of HS.

Key Words

CO₂ laser

Nominated Stream for Oral Presentations

Medical

Nursing

Allied Health

Scientific