COMBINATION LASER THERAPY FOR BURNS SCARS - PAST, PRESENT AND FUTURE (214)

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Introduction: Laser therapy has been used to assist with the rehabilitation of hypertrophic and symptomatic burns scars for many decades. Despite acceptance amongst the burns community of the efficacy of this approach, there is a paucity of good quality evidence to support the use of laser therapy to improve scar outcomes. More recent advances in laser technology, such as the development of fractionated ablative lasers, have reduced the risk of unwanted side effects from laser therapy e.g. hypopigmentation. These developments, along with an increased confidence in combination laser regimens, have the potential to broaden the therapeutic potential of laser therapy for scarring. This literature review assesses current evidence in relation to the use of laser therapy and combination laser regimens utilised in the rehabilitation of burns scars. Particular focus is made to the pulsed dye laser (PDL) and the ablative fractional CO₂ laser (AFCO₂L) - the two most commonly utilised laser modalities in scar management.

Methods: A systematic literature search was performed (Medline and Web of Knowledge) for the use of pulsed dye laser (PDL) and Ablative fractional CO₂ laser (AFCO₂L) in hypertrophic burns scarring, with all studies in English and all those reporting primary outcome measures included.

Results: The results of the literature search in terms of numbers and types of studies identified are displayed in the table below.

PDL was the only laser intervention for burns scarring that currently has higher-level evidence in support of its use, particularly for the treatment of scar erythema and itch. AFCO₂L shows good promise, particularly with respect to improvements in scar volume and texture. Combination regimens are yet to be fully scrutinised.

Conclusion: Both anecdotally and in clinical practice, there is a general acceptance of the efficacy of PDL and AFCO₂L. However, there is so far mainly low-level evidence and small numbers of studies to support the use of these lasers in the treatment of hypertrophic burns scarring. A summary of evidence, along with the proposed mechanisms of action for both lasers will be discussed in this review. An assessment of current evidence will assist in development of more robust and meaningful trials for the future. The most recent scientific theories and research behind combining laser regimens will be provided, demonstrating the potential for a synergistic approach to scar modulation. It is crucial that a standardised approach is taken for laser treatment modalities in the future in order to maximise their efficacy and combination possibilities.

<table>
<thead>
<tr>
<th>Laser</th>
<th>Randomised Controlled Trials</th>
<th>Controlled cohort study</th>
<th>Uncontrolled cohort study</th>
<th>Case-series/report</th>
<th>In-vitro experimental study</th>
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<tr>
<td>AFCO₂L</td>
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<td>2</td>
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