



Perspectives and Guidelines for using fractional ablative lasers as physical penetration enhancers to assist transcutaneous medication and drug delivery

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Abstract:

Background: Ablative fractional lasers are reported to enhance the transcutaneous drug uptake. Despite decades of research, laser-assisted drug delivery (LADD) remains a deregulatory subject and is yet to be considered as a standard therapeutic modality because of the scarcity of evidence-based human studies. Research is usually restricted to preclinical trials and ex-vivo experiments and the lack of standardized methodology concerning laser equipment and settings impede the clarification of incognitos involving this technique.

Objectives: To contextualize LADD supported by a comprehensive literature review and to provide guidelines so that professionals can be supported by academic means in their decision-making to indicate this procedure.

Conclusion: Fractional ablative lasers are potential physical penetration enhancers that disrupt the integrity of the SC, reduce the molecular diffusional path length, and produce microchannels large enough to admit macromolecules, particles, and cells into dermal layers. Research has confirmed that LADD enhances the uptake of hydrophilic compounds more efficiently. Water-soluble, high molecular weight medications suitable for intradermal and intravenous injection, or topical medications in pure formulations can be efficiently applied in the first 30 minutes after the laser treatment. The vehicle containing the active compound should be sterile and it is prudent to restrict the treatment area to avoid any potential toxicity. Finally, LADD should consist of few treatment sessions if followed by the topical application of the same substance to avoid skin sensitization.

Keywords: fractional ablative lasers; laser skin resurfacing; laser-assisted medication; laser-assisted drug delivery; physical penetration enhancers; transcutaneous medication; skin kinetics.

Biography:

Dr. Bárbara completed her training in General Surgery at



Hospital da Lagoa, in Rio de Janeiro, and then completed her postgraduate studies in Reconstructive Microsurgery at INCa (National Cancer Institute), at Universidade Federal Fluminense, in 1991. In 1992 was approved in the first place for the Post-Graduation Course in Plastic Surgery at the Pontifical Catholic University of Rio de Janeiro, at the Service of Professor Ivo Pitanguy, with whom he worked, from the beginning of his residency, in 1992, until 2016.

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