



MICROBIOLOGICAL EFFECTS OF DIFFERENT DENTAL LASER WAVELENGTHS IN THE TREATMENT OF PERI-IMPLANTITIS: A SYSTEMATIC REVIEW

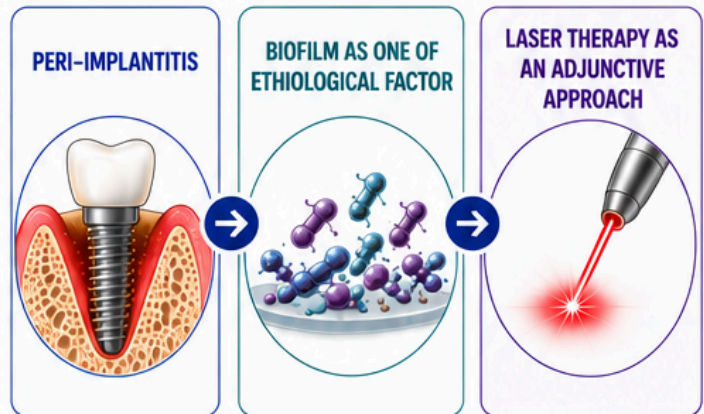
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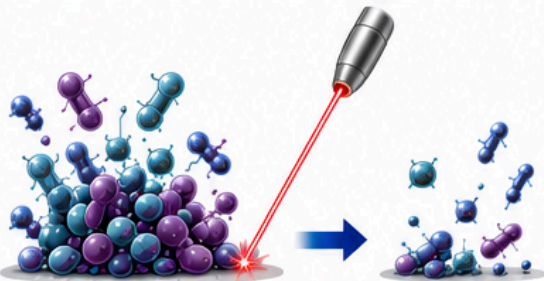
BACKGROUND

Peri-implantitis is driven by a pathogenic biofilm, making microbial decontamination a key therapeutic goal. Although different dental lasers have been introduced as adjunctive treatment modalities, their effects on the peri-implant microbiota have not been systematically summarized.



OBJECTIVE

To systematically evaluate the available *in vivo* evidence on the microbiological effects of different dental laser wavelengths in the treatment of peri-implantitis.



METHODS



DATABASES

PubMed, Scopus, Embase,
Web of Science (WoS)



SEARCH STRATEGY

(peri-implantitis OR periimplantitis) AND
(microbial OR microbiologic) AND
(laser OR Er:YAG OR erbium OR diode
OR Nd:YAG OR neodymium-doped OR
Er,Cr:YSGG OR chromium-doped)



ELIGIBILITY

In vivo studies reporting microbiological
outcomes after laser-assisted treatment
of peri-implantitis

RESULTS

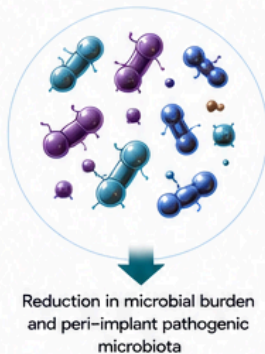


350
records
identified



15
studies
included

OVERALL EFFECT OF LASER-ASSISTED THERAPY



PERFORMANCE OF DIFFERENT THERAPIES



ANTIMICROBIAL PHOTODYNAMIC THERAPY (aPDT)

Most consistent
antimicrobial effects



DIODE LASER

Variable but generally
favorable microbiological
outcomes



ER LASER (Er:YAG / Er,Cr:YSGG)

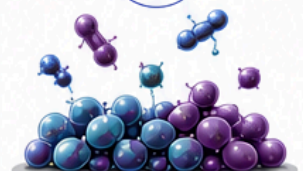
Reduced bacterial levels in several
studies, but no consistent superiority
over conventional mechanical
debridement



CONVENTIONAL MECHANICAL DEBRIDEMENT

No consistent superiority of lasers
vs. conventional treatment

FOLLOW-UP FINDINGS



Several studies reported
bacterial recolonization
during medium- and
long-term follow-up



CONCLUSION

- aPDT showed the most consistent antimicrobial effect.
- Er:YAG and diode lasers reduced bacterial levels but showed no consistent superiority over conventional mechanical debridement.
- Further well-designed randomized clinical trials are needed.



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DISCLAIMER

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