Antimicrobial Photodynamic Therapy in Peri-Implantitis Treatment – A Systematic Review

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Background

Mucositis and peri-implantitis are of multifactoral etiology. Different treatment modalities are recommended (Sahm et al. 2011, de Waal et al. 2013, Renvert et al. 2011). However, none of these methods seem to be the most efficacious for the treatment of peri-implantitis (Esposito et al. 2008, Bidra 2012, Esposito et al. 2012). The use of adjunct antimicrobial photodynamic therapy (aPDT) for the treatment of peri-implantitis is also under discussion (Andersen et al. 2007, Berakdar et al. 2012, Campos et al. 2013, Sgolastra et al. 2013). While some investigations reported the additional outcome benefits of a gain in attachment level and reduction of probing depth through adjunctive aPDT to scaling and root planning, others failed to confirm these results.

Aim

To review the literature of adjunctive antimicrobial photodynamic therapy (aPDT) in patients suffering from peri-implantitis.

Material and Methods

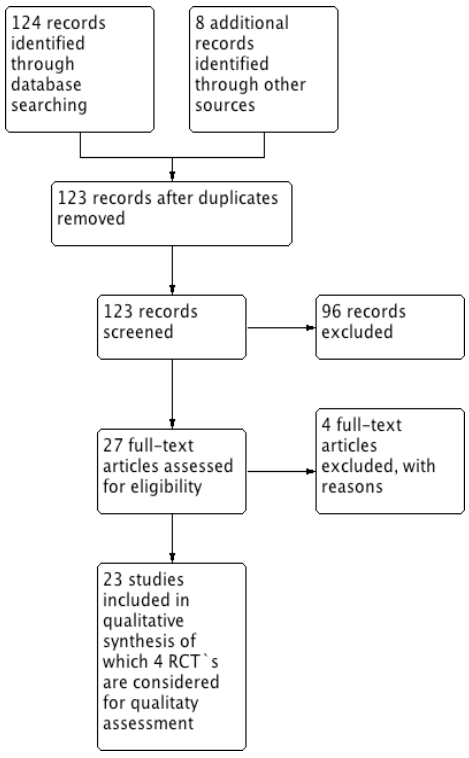
#1	MeSH	Periodontal disease
#2	Search all text	(peri-implantitis) OR (mucositis) OR (periodontal disease) OR (periodontal therapy) OR (periodontal maintenance) OR (oral biofilm infection)
#3	MeSH	Photochemotherapy
#4	Search all text	(antimicrobial photodynamic therapy) OR (photodynamic therapy) OR (photochemotherapy) OR (photosensitizer) OR (photosensitization) OR (photodynamic antimicrobial chemotherapy) OR (phenothiazines) OR (phthalocyanines) OR (reactive oxygen)
#5	Search all text	(helbo) OR (fotosan) OR (pact) OR (periowave) OR (aseptim)
#6	History	#1 OR #2
#7	History	#3 OR #4 OR #5
#8	History	#6 OR #7
#9	Search all text	(guideline) OR (Health Technology Assessment) OR (Random* Controlled Trial) OR (Control* Clinical Trial) OR (Assess) OR (health technology) OR (medical) OR (review) OR (meta-analysis) OR (cohort study) OR (controlled trial) OR (clinical trial) OR (case control)
#10	History	#8 AND #9

Databases	Manual journal search
Medline	Journal of Clinical Periodontology
EMBASE	Journal of Periodontology
EMBASE alert	International Journal of Periodontics & Restorative Dentistry
BIOSIS	Journal of Dental Research
SciSearch	Lasers in Medical Science
CCMED	Journal of Photochemistry and Photobiology
CENTRAL	Journal of Periodontal Research
Science Citation Index	Clinical Oral Implants Research
International Clinical Trial Register Platform	Journal of Oral Implantology
Web of Science	Journal of Dental Implantology
ISI Web of Knowledge	Journal of Implant and Advanced Clinical Dentistry
Wiley Interscience	
UKCRN	

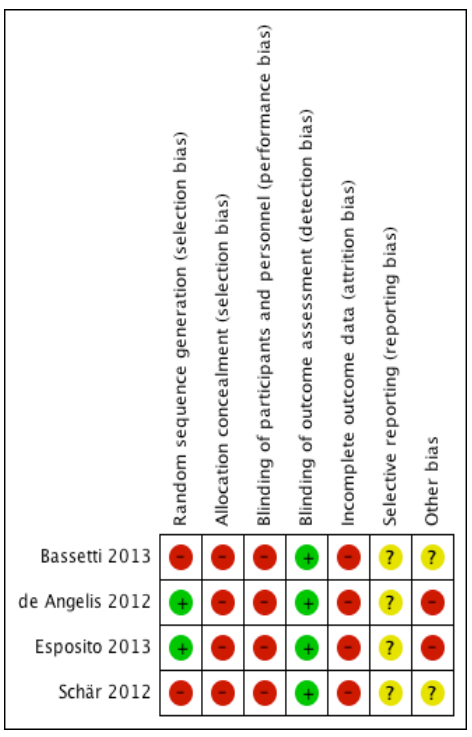
Study selection and data collection

To minimise the potential risk of reviewer bias, a second blinded reviewer independently screened all of the titles and abstracts retrieved by electronic and manual searches. Discrepancies regarding inclusion and exclusion of identified studies were resolved by discussion between the two reviewers. The data extraction from included articles regarding laser setting, irradiation time, photosensitisers, reported outcome, randomisation, blinding, intervention, and comparison as well as analysis of the studies' methodological quality was performed by one reviewer.

Results



	Treatment arms	Photosensitiser	Laser	Findings
Bassetti 2013	Intervention: SRP+aPDT Comparison: SRP+LDD	Phenothiazine chloride	660nm diode laser Irradiation 60s	No significant additional benefit of adjunctive aPDT
Schär 2012	Intervention: SRP+aPDT Comparison: SRP+LDD	Phenothiazine chloride	660nm diode laser Irradiation 60s	No significant additional benefit of adjunctive aPDT
Esposito 2013	Intervention: Surgical/ non-surgical + aPDT Comparison: Surgical/ non-surgical	Toluidine blue	Laser not cited Irradiation 60s	No significant differences between groups
de Angelis 2012	Intervention: Surgical/ non-surgical + aPDT Comparison: Surgical/ non-surgical	Toluidine blue	Laser not cited Irradiation 60s	No significant differences between groups



Conclusion

According to the present investigation, aPDT cannot be recommended for peri-implantitis treatment. There is insufficient evidence in terms of additional clinical benefits. Further high-quality RCT`s are needed to investigate the influence of potential confounders on the efficacy of (adjunctive) aPDT in peri-implantitis treatment.