Adjunctive Antimicrobial Photodynamic Therapy in Chronic Periodontitis Treatment - A Meta Analysis

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Background

The use of adjunct antimicrobial photodynamic therapy (aPDT) for the treatment of chronic or aggressive periodontitis is well documented in the literature (Andersen et al. 2007, Al-Zaharani et al. 2009, Berakdar et al. 2012, Campos et al. 2013), and the additional outcome benefits of gain in attachment level and reduction of probing depth through adjunctive aPDT to scaling and root planing have been confirmed by meta-analyses (Sgolastra et al. 2011, Sgolastra et al. 2013).

Aim

To investigate the efficacy of adjunctive antimicrobial photodynamic therapy (aPDT) in patients suffering from chronic periodontitis.

Material and Methods

Table 1: Search strategy: searched databases and journals

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

A comprehensive literature search of electronic databases was performed to identify relevant studies followed by a manual search of several dental journals (Tab. 1). For this purpose, a recommended structured approach was used using five components commonly known by the acronym "PICO" (O'Connor et al. 2009), Tab. 2.
The primary outcomes for the analysis were probing depth reduction and attachment gain. The effect size was estimated and reported as the mean difference, and the 95% confidence interval (CI) was calculated.

Table 2: Search strategy

PICO	
Population	Patients with a diagnosis of gingivitis, chronic or aggressive periodontitis, mucositis or peri-implantitis
Intervention	Antimicrobial photodynamic therapy as adjunct or single option
Comparison	Scaling and root planing in a surgical or non-surgical approach
Outcome	Probing depth, attachment level, gingival recession, bleeding on probing, bacterial load

Results

The search identified 811 publications without overlap. 15 articles were considered relevant and were included in the meta-analysis. The results are given in Figures 1 to 5.

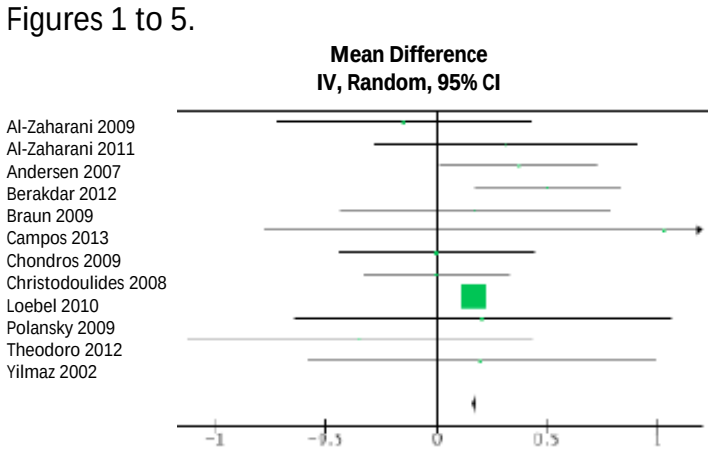

Figure 1 Favours control SRP Favours experimental SRP + aPDT
Probing Depth reduction (mm) Follow-up 3 months
Total 95% CI 0.17 (0.16, 0.18) p < 0.00001

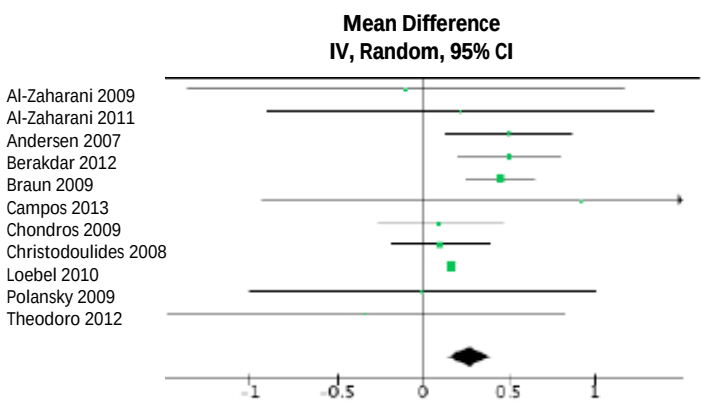

Figure 2 Favours control SRP Favours experimental SRP + aPDT
Gain in Attachment Level (mm) Follow-up 3 months
Total 95% CI 0.27 (0.14, 0.40) p < 0.0001

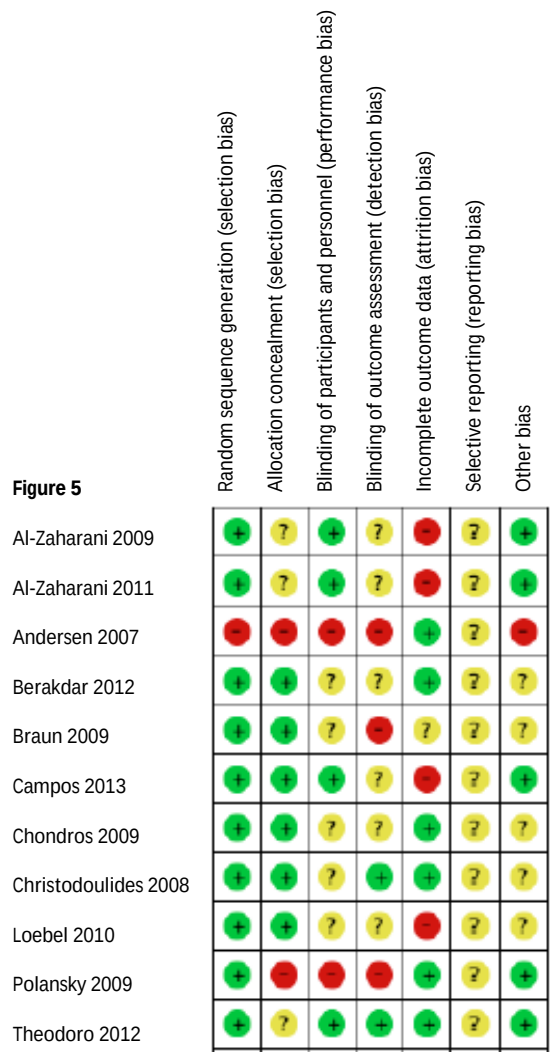

Figure 5

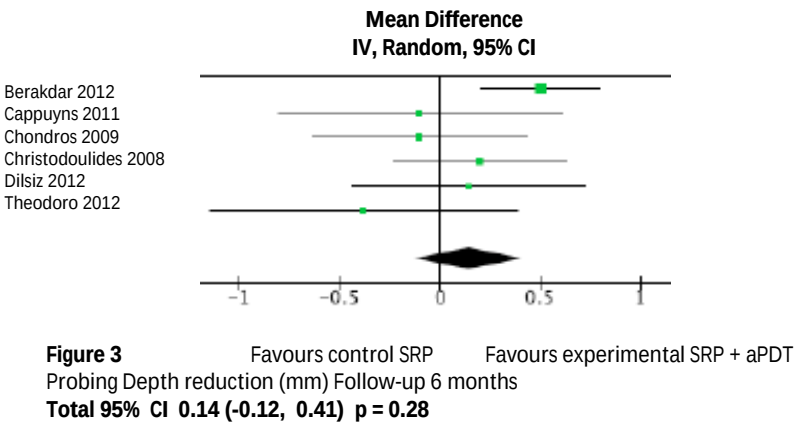

Figure 3 Favours control SRP Favours experimental SRP + aPDT
Probing Depth reduction (mm) Follow-up 6 months
Total 95% CI 0.14 (-0.12, 0.41) p = 0.28

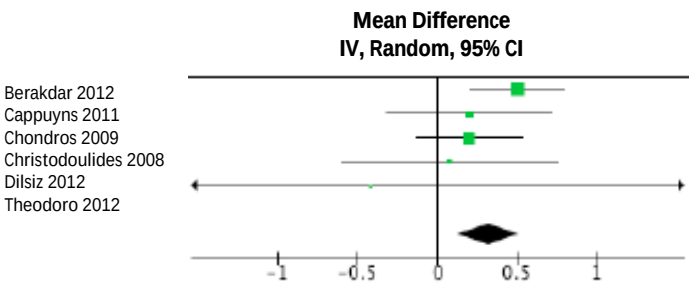

Figure 4 Favours control SRP Favours experimental SRP + aPDT
Gain in Attachment Level (mm) Follow-up 6 months
Total 95% CI 0.32 (0.13, 0.51) p = 0.001

Conclusion

While there is strong clinical evidence of short-term benefits for PD reduction (mm) and AL gain (mm), weak evidence is available for long-term benefits of adjunctive antimicrobial photodynamic therapy in chronic periodontitis.