International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

Antibiotic effects on oral biofilm-induced disease: key knowledge applied to peri-implantitis management. A Systematic review and network meta-analysis

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 29 April 2025 and was last updated on 29 April 2025.

INTRODUCTION

Review question / Objective To evaluate the effectiveness of local and systemic antibiotic therapies, combined with mechanical debridement, in the surgical and non-surgical treatment of peri-implantitis.

Condition being studied Peri-implantitis treatment.

METHODS

Search strategy Two review authors conducted a duplicate search for studies. Five databases were explored (PubMed/MEDLINE, the Cochrane Central Register of Controlled Trials, Embase, Web of Science, and LILACS) to find relevant articles published before March 2025, with no publication date or language limitations. Additionally, gray literature was examined using the OpenGrey database (www.opengrey.eu), and reference lists of the identified studies were cross-referenced to discover other potential studies for inclusion.

Participant or population Patients undergoing non-surgical or surgical peri-implantitis treatment.

Intervention Non-surgical or surgical peri-implantitis treatment associated with systemic or local antibiotics administration.

Comparator Non-surgical treatment (MD vs. MD + antibiotic [systemic or local]) or surgical treatment (OFD vs. OFD + antibiotic [systemic or local]).

Study designs to be included Observational (cohort studies), controlled clinical trials, and randomized clinical trials (RCTs).

Eligibility criteria Animal studies, in vitro studies, case series, case reports, and reviews were excluded. No studies were excluded due to language, publication date, or number of patients.

Information sources PubMed/MEDLINE, the Cochrane Central Register of Controlled Trials, Embase, Web of Science, and LILACS.

Main outcome(s) The primary outcome was the PPD.

Additional outcome(s) The secondary outcomes were BoP, CAL, PLI, and MBL.

Quality assessment / Risk of bias analysis The risk of bias in the included studies was independently assessed by two researchers, based on version 2 of the Cochrane risk-of-bias tool for RCTs (RoB 2) and the ROBINS-I31 tool for observational studies. The RoB 2 tool allowed for a detailed analysis of seven key domains, including selection bias (randomization and allocation concealment), performance bias (blinding of participants and personnel), detection bias (blinding of outcome assessors), attrition bias (incomplete outcome data), reporting bias (selective reporting of results), and other potential biases. The ROBINS-I tool analyzed biases related to confounding, participant selection, intervention classification, deviations from intended interventions, missing data, outcome measurement, and reporting of selected results.
Based on the detailed description of the methodological procedures in the studies, each domain in both tools was classified as having a 'low risk of bias,' 'moderate risk of bias,' or 'high risk of bias. ' Regardless of the analysis's result, no study was excluded based on the risk of bias within studies.

Strategy of data synthesis Changes from baseline within groups, along with their standard deviations, were computed for the outcomes of each trial. Subsequently, the mean differences (MDF) between groups and their corresponding 95% confidence intervals (CI) for the trial outcomes were determined. When the study reported only the initial and final means, the mean change from the baseline for each treatment group was calculated by subtracting the final mean from the baseline mean. Standard deviations (SD) for the changes from baseline were estimated using a correlation coefficient derived according to Cochrane guidelines, along with the SD for the baseline and final means for each group. When there were direct comparisons between the same groups, a pairwise meta-analysis of MD was conducted using the inverse-variance weighting method. The random effect model was chosen for the analyses due to the variation in available evidence (e.g., populations, follow-up times, and settings). Periimplantitis data from clustered studies were treated according to the Cochrane manual. A within-patient correlation coefficient of 0.07 was used, and sample sizes were revised in studies that did not adjust for clustering. Heterogeneity was assessed using the Chi2 tests, with low heterogeneity considered for values ≤ 25%, moderate heterogeneity considered for values > 25% but ≤ 50%, and high heterogeneity considered for values > 50. The statistical significance level of the meta-analysis effect was set at $P < 0.05$. The Review Manager software (version 5.2.8, Copenhagen, Denmark, 2014) was used for the analyses.

Subgroup analysis Not applicable.

Sensitivity analysis Not applicable.

Language restriction Not applicable.

Country(ies) involved Brazil and United States.

Keywords Peri-implantitis, antibiotics, metronidazole, amoxicillin, mechanical debridement, network meta-analysis, systematic review, marginal bone loss.

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