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INPLASY

Effects of the silver coatings on bone formation on implant surface in animal models: A systematic review and meta-analysis

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Alenezi, A.

Corresponding author:
Ali Alenezi

ali.alenezi@qu.edu.sa

Author Affiliation:
Qassim University.

ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202590035

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 10 September 2025 and was last updated on 10 September 2025.

INTRODUCTION

Review question / Objective To review and evaluate the effects of silver coatings of implant surfaces on some quantitative parameters of bone formation.

Rationale To investigate if the antibacterial properties of silver coating can influence the bone formation process around dental implants.

Condition being studied Animals studies that evaluated the use of silver coatings with endosseous implants.

METHODS

Search strategy An electronic literature search was undertaken in May 2025 across three databases (PubMed, Web of Science, and Scopus). Only studies published within the last 20 years were considered.

Participant or population Animals.

Intervention Ti implants modified or coated with silver.

Comparator Ti implants without silver modifications or coatings.

Study designs to be included Eligibility criteria encompassed studies conducted on animals that evaluated the use of silver coatings with endosseous implants.

Eligibility criteria Eligibility criteria encompassed studies conducted on animals that evaluated the use of silver coatings with endosseous implants. Implant placement required an implant with a silver-modified surface, achieved by incorporating silver into the substrate or applying a surface coating, either prior to or at the time of insertion.

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Information sources An electronic literature search was undertaken in May 2025 across three databases (PubMed, Web of Science, and Scopus). Only studies published within the last 20 years were considered.

Main outcome(s) The values of bone-implant contact (BIC), bone area (BA), or bone volume with implants in control and test groups. The compared groups showed show similar implant surface treatment beside the presence of silver in the test group.

Data management All studies identified in the initial search were screened for eligibility according to the prespecified inclusion criteria. Full-text retrieval was performed for studies that looked eligible and for those whose titles/abstracts lacked sufficient detail to determine eligibility.

Quality assessment / Risk of bias analysis Methodological quality was evaluated per ARRIVE 2.0 (Animal Research: Reporting of In Vivo Experiments) guidelines.
AND
By use of SYRCLE's risk of bias tool.

Strategy of data synthesis Continuous outcomes assessed included the percentages of BIC, BA, and BV/TV. Weighted mean differences will be used to generate forest plots, with the number of implants in each group serving as the statistical unit.

Subgroup analysis None planned.

Sensitivity analysis Intervention effects were reported as mean differences (MD) in percentage, along using 95% confidence intervals (CI).

Language restriction Only articles published in English were included.

Country(ies) involved Saudi Arabia.

Keywords Silver-coated titanium implants; bone formation; peri-implantitis; antibacterial coatings; animal models; meta-analysis.

Dissemination plans The raw data supporting the conclusions of this article will be made available by the authors on request.

Contributions of each author

Author 1 - Ali Alenezi.
Email: ali.alenezi@qu.edu.sa

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