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Preventive Strategies for early erosive tooth wear: A systematic Review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - King Khalid University.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202590056

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 September 2025 and was last updated on 14 September 2025.

INTRODUCTION

Review question / Objective To evaluate and compare the effectiveness of various non-restorative preventive strategies for managing early erosive tooth wear (ETW) through network meta-analysis (NMA).

Rationale Rising prevalence of early ETW and the absence of a comprehensive NMA comparing multiple preventive agents motivated this study to inform evidence-based clinical choices.

Condition being studied Early erosive tooth wear in adolescents and adults.

METHODS

Search strategy A PICO-based, database-adapted search of PubMed, Cochrane, Scopus, Web of Science and ScienceDirect up to April 2025.

Participant or population Adolescents and adults with early signs of enamel erosion examined in in-situ or in-vivo RCTs and crossover studies.

Intervention Non-restorative preventive strategies, including fluoride-based agents, casein phosphopeptide-amorphous calcium phosphate (CPP-ACP).

Comparator Placebo or active remineralizing agents for direct or indirect efficacy comparisons.

Study designs to be included Randomized controlled trials (RCTs), crossover in situ or in vivo studies evaluating at least one anti-erosive or remineralizing strategy.

Eligibility criteria RCTs and comparative interventional studies reporting enamel wear in quantifiable terms, published between 2010 and 2025, with exclusion of animal studies, in vitro-only studies, non-randomized designs.

Information sources PubMed/MEDLINE, Cochrane Library, Scopus, Web of Science, ScienceDirect and manual searches of reference lists.

Main outcome(s) Quantitative enamel loss and surface microhardness recovery.

Additional outcome(s) Subsurface remineralization parameters, surface roughness, and mineral concentrations.

Data management Data were extracted independently by two reviewers using a pre-tested Microsoft Excel sheet, with disagreements resolved by a third blinded author.

Quality assessment / Risk of bias analysis RCTs were appraised with RoB2 and visualized via robvis, with high-risk studies identified and considered in sensitivity analyses.

Strategy of data synthesis A network meta-analysis was performed using the MetaInsight web-based platform, employing both frequentist and Bayesian random-effects models to synthesize data.

Subgroup analysis Not applicable.

Sensitivity analysis Sensitivity analyses were conducted by excluding studies with a high or unclear risk of bias to confirm the stability of the effect estimates.

Language restriction Included only English-language publications.

Country(ies) involved Saudi Arabia, United States of America, India.

Other relevant information The review followed PRISMA-NMA guidelines.

Keywords Erosive tooth wear; stannous fluoride; sodium fluoride; CPP-ACP; remineralization; network meta-analysis; enamel loss; microhardness.

Dissemination plans Data to be Published in peer reviewed journals and intended to be presented in conferences.

Contributions of each author

Author 1 - Kanwalpreet Kaur - Conceptualization and methodology.
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