

INPLASY

Silver Diamine Fluoride versus Conventional Restorative Treatment for Dental Caries in Primary Teeth of Children: A Meta-Analysis

INPLASY202660079

doi: 10.37766/inplasy2026.6.0079

Received: 17 June 2026

Published: 17 June 2026

Chang, P; Liang, YY; Li, XL; Wang, T; Li, R.

Corresponding author:

Rui Li

lirui_lir746@163.com

Author Affiliation:

The First Medical Center of PLA General Hospital.

ADMINISTRATIVE INFORMATION

Support - This research did not receive any funding support.

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

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202660079

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 17 June 2026 and was last updated on 17 June 2026.

INTRODUCTION

Review question / Objective To compare silver diamine fluoride (30%-38% SDF) with conventional restorative treatment for caries arrest in primary teeth of children with early childhood caries, and assess treatment time, adverse events and other related clinical outcomes via meta-analysis.

Condition being studied Early childhood caries (ECC), a prevalent chronic oral disease in children. Cavitated carious lesions extending into dentin (ICDAS 5-6) of primary teeth are the main research focus, which brings heavy public health burden globally and in China.

METHODS

Participant or population Children aged 0 to 13 years with dentinal caries on primary teeth. Studies with only permanent teeth or unextractable primary tooth data were excluded.

Intervention Topical application of 30% or 38% (w/v) silver diamine fluoride (SDF) on cavitated primary tooth lesions, with single or repeated application according to study protocols.

Comparator Conventional restorative treatment, including atraumatic restorative treatment (ART), interim restorative treatment (IRT) and glass ionomer cement (GIC) based cavity restoration for primary teeth caries.

Study designs to be included Randomized controlled trials (RCTs), including individual randomization and cluster randomization. The minimum follow-up period is 6 months. Non-randomized studies, case reports, reviews and conference abstracts without full texts are excluded.

Eligibility criteria 1. Follow-up duration no less than 6 months; Lesions must be dentinal caries (ICDAS 5-6); 2. Report qualified clinical outcomes related to caries arrest; 3. Exclude studies comparing SDF with fluoride varnish, sealants or

silver nitrate without restorative components; 4. Full texts available in English or Chinese, grey literature not included.

Author 3 - Xiao-Long Li.
Author 4 - Tao Wang.
Author 5 - Rui Li.

Information sources Five electronic databases: PubMed, Embase, Web of Science, Cochrane Library and Scopus (searched Jan 2010 – Jun 2025). Manual screening of reference lists of included studies and relevant systematic reviews.

Main outcome(s) Primary outcome: Caries arrest rate/lesion inactivity at tooth or surface level (prioritize 12-month follow-up data, minimum 6 months), measured by risk ratio (RR) with 95% CI. Secondary outcomes: treatment duration, adverse events, child cooperation, caregiver acceptance and retreatment needs.

Quality assessment / Risk of bias analysis Cochrane Risk of Bias 2 (RoB 2) tool was used. Five domains were assessed: randomization process, intervention deviation, missing outcome data, outcome measurement and result reporting selection. Each study was rated as low risk, some concerns or high risk of bias.

Strategy of data synthesis Hartung-Knapp random-effects model was used for pooled analysis. Dichotomous outcomes adopted RR; continuous outcomes used MD or SMD. Heterogeneity was evaluated via I^2 statistic, τ^2 and chi-squared test. RevMan 5.4 and R 4.2.1 with meta/metafor packages were applied.

Subgroup analysis Exploratory subgroups: analysis unit (tooth/surface level), SDF concentration (30%/38%), application frequency, comparator type, follow-up duration, study setting and overall risk of bias. All analyses were descriptive without meta-regression.

Sensitivity analysis 1. Leave-one-out analysis to test the influence of single individual study. 2. Sensitivity analysis by excluding cluster-randomized trials. 3. Assess impacts of different outcome definitions and clustering effects on pooled results.

Country(ies) involved China - The First Medical Center of PLA General Hospital.

Keywords Silver Diamine Fluoride; Dental Caries; Primary Teeth; Atraumatic Restorative Treatment; Meta-Analysis.

Contributions of each author

Author 1 - Ping Chang.
Author 2 - Yuan-Yuan Liang.