



Tradition to innovation: all-in-one irrigators in endodontics - systematic review

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ABSTRACT

Introduction: Endodontic treatment requires effective irrigation for smear layer removal and intraradicular bacterial reduction. Conventional sodium hypochlorite and ethylenediaminetetraacetic acid protocols have limitations regarding operative complexity and effects on dentin. All-in-one irrigants (Triton All-in-One®, Dual Rinse HEDP®, QMix 2in1) aim to simplify protocols by combining antimicrobial and cleaning actions.

Objectives: This study aimed to evaluate, via systematic review, the efficacy of all-in-one irrigants versus conventional protocols in smear layer removal and bacterial reduction.

Methodology: The search was conducted in accordance with PRISMA guidelines across the PubMed, Europe PMC, and LILACS databases (2020-2025). Study selection was performed independently by two reviewers. Inclusion criteria comprised studies (in vitro, ex vivo, or clinical) on single-rooted human teeth addressing the topic. Animal/primary dentition, curved/artificial canals, reviews, and studies without a control group were excluded.

Results: 12 studies were included in the qualitative analysis. Laboratory data indicate that all-in-one solutions exhibit smear layer removal and antimicrobial efficacy comparable or superior to traditional protocols, notably preserving dentin mechanical properties, though variations occurred based on application time.

Conclusion: Laboratory evidence suggests that all-in-one irrigants are a promising alternative to traditional protocols; however, current clinical evidence is scarce, and further clinical trials are mandatory to confirm their in vivo efficacy and safety. Potential simplification of the irrigation procedure, which may reduce operative time and the risk of accidents during non-surgical endodontic treatment.

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