

Is calcium hydroxide more effective than formocresol or camphor phenol as intracanal disinfectants in acute pulpitis among deciduous teeth?

Parthasarathy Madurantakam¹

A Commentary on

Jia L, Zhang X, Shi H, Li T, Lv B, Xie M.

The Clinical Effectiveness of Calcium Hydroxide in Root Canal Disinfection of Primary Teeth: A Meta-Analysis. *Med Sci Monit* 2019; **25**: 2908–2916. DOI: 10.12659/MSM.913256. PubMed PMID: 31004424.

Abstract

Data sources Cochrane Library, PubMed, Ovid, ScienceDirect, Wiley, China Biology Medicine (CBM), China National Knowledge Infrastructure (CNKI), Wan Fang and VIP Database for Chinese Technical Periodicals (VIP) databases were searched for articles dating from January 2000 to July 2018. Studies in languages other than English or Chinese were excluded.

Study selection Randomised controlled trials comparing the clinical effectiveness of calcium hydroxide to formocresol or camphor phenol in acute pulpitis of deciduous teeth requiring root canal treatment were included. The primary outcome was clinical effectiveness while the secondary outcome was incidence of endodontic inter-appointment emergencies.

Data extraction and synthesis Two authors independently screened titles and abstracts of all studies identified through the search and reviewed full articles against established inclusion/exclusion criteria. Any disagreements between the authors were resolved by consensus or by consulting relevant experts. Risk of bias assessment was carried out using the Cochrane collaboration tool. Clinical effectiveness and incidence of inter-appointment endodontic emergencies were expressed as odds ratio and 95% CI. Heterogeneity was assessed using Q-test and I² measurement. Appropriate models were used for meta-analysis based on heterogeneity.

Results A total of 16 randomised trials informed the meta-analysis. Clinical effectiveness of calcium hydroxide was compared to formocresol in 12 studies and pooled data indicate that calcium hydroxide was significantly better in terms of clinical effectiveness (OR = 3.37; 95% CI 2.54 to 4.48), and was associated with significantly decreased inter-appointment emergency visits (OR = 0.26; 95% CI 0.16 to 0.42). Calcium hydroxide was compared to camphor phenol in seven studies and was shown to be significantly superior in its clinical effectiveness (OR = 5.50; 95% CI 3.36 to 8.98).

Conclusions Limited available evidence suggest calcium hydroxide was superior to formocresol and camphor phenol as intracanal medicaments in the management of acute pulpitis in deciduous teeth.

Practice point

Calcium hydroxide appears to be the preferred intracanal medicament following pulpectomy in primary teeth when compared to formocresol or camphor phenol.

Commentary

Clinical question

The review addresses the question: ‘is calcium hydroxide better than formocresol or camphor phenol in terms of clinical effectiveness when used as root canal disinfectant in primary teeth.’ Being a systematic review and a meta-analysis, the authors should have ideally focused on the condition being treated rather than two specific medicaments chosen for comparison. This is even more important given the wide variety of commercially available intracanal medications. A better question would have been: ‘the clinical effectiveness of intracanal medicaments following pulpectomy in primary teeth’.

Literature search

The authors searched multiple databases (until July 2018) using minimal terms and restricting articles to English or Chinese, possibly excluding other relevant studies. Though the authors mention retrieving two articles from the Cochrane library, those articles are neither listed nor reasons provided for their exclusion. This is important because there is a relevant Cochrane review update (May 2018) on ‘Pulp treatment for extensive decay in primary teeth’¹ that provides an exhaustive review of different pulp therapies (pulp capping, pulpotomy and pulpectomy) and intracanal medicaments in primary teeth. The authors’ search should have identified this review or their prior versions (2003 and 2014) and included it, or provided reasons for exclusion.

Risk of bias assessment

Even though the authors provided overall risk of bias of all the included studies, the risk of bias of the 16 independent randomised trials is not provided and this makes the interpretation of the -evidence very difficult. The authors’ discussion of the risk of bias (RoB) of included studies is also very shallow and contradictory. While the RoB table shows a high risk of bias among the majority of studies across multiple domains, the authors conclude that the quality of included studies were high (based on them being RCTs). Even though the authors report that the publication bias was small, no funnel plots were presented.

Results

A total of 16 randomised controlled trials were included in the final meta-analysis. All included studies lacked heterogeneity in

GRADE rating



reported primary and secondary outcomes. Data synthesised from 12 studies indicate calcium hydroxide is significantly better than formocresol in terms of clinical effectiveness and reducing the incidence of emergency appointments at seven days. Data from seven RCTs inform that calcium hydroxide is better than camphor phenol in clinical effectiveness.

Summary

Overall, the scope of the review is severely restricted by limiting the included studies only to those comparing formocresol or camphor phenol against calcium hydroxide following pulpectomy in primary teeth. As acknowledged by the authors, all included studies were published in Chinese and may reflect the extensive use of formocresol

and camphor phenol in specific geographic areas. This limits the generalisability of the results of the review. The language of the review and incorrect citations of the references add to the confusion.

References

1. Smail-Faugeron V, Courson F, Durieux P, Muller-Bolla M, Glenny A M, Fron Chabouis H. Pulp treatment for extensive decay in primary teeth. *Cochrane Database Syst Rev* 2018; CD003220. DOI: 10.1002/14651858.CD003220.pub3.

Address for correspondence

¹Associate Professor, Department of General Practice, VCU School of Dentistry, Richmond, VA, USA

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