The prevalence of postoperative pain and flare-up in single- and multiple-visit endodontic treatment: a systematic review

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CRD summary
The authors stated that there is no compelling evidence that single-visit or multiple-visit treatments for root canal differ in terms of post-operative pain or flare ups. Given the unclear quality of included studies, the authors’ conclusions are appropriate.

Authors’ objectives
To assess the impact of single-visit versus multiple-visit treatments on pain and flare-up in patients undergoing root canal surgery.

Searching
MEDLINE (1966-January 2007), EMBASE (1988-January 2007) and CENTRAL were searched. No language restrictions were applied. Search terms were reported. Six theses databases and BIOSIS Previews were searched to identify unpublished materials. References from identified articles were handsearched and a citation search of retrieved articles was carried out using the Science Citation Index.

Study selection
Studies of patients undergoing single-visit or multiple-visit treatment for root canal surgery were eligible for inclusion. Included studies were reported to use a variety of endodontic procedures, most of which followed accepted clinical protocol. Sodium hypochlorite was used as an irrigant in concentrations ranging from 0.5 per cent to 5.25 per cent. Various medications were used in included studies, including metacresylacetate, calcium hydroxide, formocresol, camphorated parachlorophenol (CMCP) and no medication. Outcomes eligible for inclusion were frequency and/or severity of pain and prevalence of flare ups as measured by number of patients returning to the practice for further active treatment. Pain outcomes in included studies were dichotomous outcomes or multiple-point pain scales. Duration of follow up in the included studies ranged from six hours to 30 days, with the most common follow up point being 48 hours. Inclusion criteria for study design were not stated.

The authors stated neither how the studies were selected for the review nor how many reviewers performed the study selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The authors stated neither how the data were extracted for the review nor how many reviewers performed the data extraction. Scores on multiple-point pain scales were converted to dichotomous scores for the purpose of analysis.

Methods of synthesis
The results were combined in a narrative synthesis. Results were discussed separately according to whether studies were of patients with apical periodontitis, patients with no apical periodontitis, mixed periapical status or re-treatment cases. Individual study results were plotted on a L’Abbe plot to depict the level of agreement between studies.

Results of the review
Sixteen studies were included for review (n= 5,081 teeth): six RCTs (n=1,048); seven prospective cohort studies (n=2,963); two retrospective cohort studies (n=683) and one cohort study where it was not possible to establish whether it was retrospective or prospective (n=387).

There was wide variation in results between included studies. In patients with apical periodontitis, one prospective
A cohort study found that a single-visit treatment was more likely to result in post-operative pain compared to multiple-visit treatment in patients with apical periodontitis (n = 405, OR = 2.8, 95% confidence interval (CI): 1.7, 4.7, p < .0001). However, one retrospective cohort study found that multiple-visit treatment was more likely to result in post-operative flare ups (n = 402, OR = 2.8, 95% CI: 1.1, 7.1, p = .03). There was no significant difference in post-operative pain levels between single-visit treatment compared to multiple-visit treatments in patients with no acute periodontitis (three studies, n = 428). In studies where there was mixed or unknown periapical status, eight out of 10 studies found no significant differences in pain or flare ups between single-visit or multiple-visit treatment in groups of patients with mixed or unknown periapical status (n = 2,248 for studies finding no difference; n = 1,371 for studies favouring a single visit). One RCT found that the risk of flare up was higher in patients undergoing re-treatment in a single visit compared to patients undergoing multiple visit treatments (n = 227, OR = 4.9, 95% CI: 1.1, 19, p = .05).

Authors' conclusions
There is no compelling evidence that single-visit and multiple-visit treatments for root canal differ in terms of post-operative pain or flare ups.

CRD commentary
Inclusion criteria for participants and intervention were implicit in the review question, but not explicitly defined. Inclusion criteria were stated clearly for outcomes, but not for study design. Three relevant databases were searched. Appropriate steps were taken to minimise language and publication bias. It is unclear whether appropriate steps to rule out reviewer error and bias were taken in the study selection and data extraction processes. A validity assessment was not carried out. Therefore, it was not possible to determine the quality of included studies. However, the authors stated that none of the studies justified sample-size selection. The decision to include studies in a narrative analysis appears appropriate. Given the unclear quality of included studies, the authors' conclusions are appropriate.

Implications of the review for practice and research
Practice: the authors did not state any implications for practice.

Research: the authors stated that in future studies pre-operative pain should be recorded so that improvement or deterioration in pain as opposed to simply presence of pain may be used as an outcome measure. Future clinical studies should be reported according to CONSORT guidelines with sample size selection justified and reported.

Funding
Not stated.

Bibliographic details

PubMedID
17956561

DOI
10.1111/j.1365-2591.2007.01316.x

Indexing Status
Subject indexing assigned by NLM

MeSH
Episode of Care; Humans; Pain, Postoperative /classification /etiology; Retreatment; Root Canal Therapy /adverse effects /methods

AccessionNumber
12008102786
Date bibliographic record published
03/11/2008

Date abstract record published
02/03/2009

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.