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[Intervention Review]

Hand and ultrasonic instrumentation for orthograde root canal treatment of permanent teeth

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ABSTRACT

Background

Endodontic treatment of root canals or root canal treatment is a frequently performed dental procedure and is carried out on teeth in which irreversible pulpitis has led to necrosis (death) of the dental pulp (nerve). Removal of the necrotic tissue remnants and cleaning and shaping of the root canal are important phases of root canal treatment. Treatment options include the use of hand and rotary instruments and methods using ultrasonic or sonic equipment.

Objectives

The objectives of this review were to determine the relative clinical effectiveness of hand instrumentation versus ultrasonic instrumentation alone or in conjunction with hand instrumentation for orthograde root canal treatment of permanent teeth.

Search methods

We searched the Cochrane Oral Health Group Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE and LILACS. We searched the reference lists of relevant articles in an attempt to locate additional published and unpublished trials. No language restriction was applied. The last electronic search was conducted in December 2007.

Selection criteria

Randomised controlled trials involving people over 18 years of age with single and multiple permanent teeth with a completely formed apex and with no evidence of internal resorption requiring root canal treatment were included. Patients undertaking re-treatment of a tooth were excluded.

Data collection and analysis

Screening of eligible studies was conducted in duplicate and independently. Results were to be expressed as fixed-effect or random-effects models using mean differences for continuous outcomes and risk ratios for dichotomous outcomes with 95% confidence intervals. Heterogeneity was to be investigated including both clinical and methodological factors.

Main results

No eligible randomised controlled trials were identified.

Authors' conclusions

This review illustrates the current lack of published or ongoing randomised controlled trials and the unavailability of high level evidence, based on clinically relevant outcomes, for the effectiveness of ultrasonic instrumentation used alone or as an adjunct to hand instrumentation for orthograde root canal treatment.

Future randomised controlled trials might focus more closely on evaluating the effectiveness of combinations of these interventions with an emphasis on not only clinically relevant but also patient-centred outcomes.

PLAIN LANGUAGE SUMMARY

Hand and ultrasonic instrumentation for orthograde root canal treatment of permanent teeth

Root canal treatment is a frequently performed dental procedure which is carried out on teeth in which the nerve has died.

Removal of the tissue remnants and cleaning and shaping of the root canal are important steps for success. These may include the use of hand and rotary instruments and ultrasonically powered equipment.

The review authors found that there is currently insufficient high level evidence for the effectiveness of ultrasonic instrumentation used alone or in conjunction with hand instrumentation for orthograde root canal treatment and suggest that future studies might focus more closely on evaluating the effectiveness of the use of ultrasonic instrumentation in conjunction with hand instrumentation.