**Title:** Genetic predisposition to persistent apical periodontitis

**Author:** Masrani et al

**Journal:** JOE Vol 37, Number 4 April 2011

**Reviewer:** Chaiwing Hsiao, DMD

**Purpose:** To investigate the relationship of genetic polymorphism in IL-1 β and persistent apical periodontitis.

**Materials and Methods:** Retrospective case control study There were 34 cases with PAP and 61 controls.

- **Inclusion criteria** were as follows: no obvious reason for root canal failure, single or multiple visit RCT, intra canal medicament used or not, and good health.
- **Exclusion criteria** were pts. younger than 18 yrs, presence of micro leakage, missed canals, separated instruments, obturation more than 2mm short of the radiographic apex, overfilled teeth, poorly condensed, vertical root fracture, severe medical conditions.
- **Persistent apical periodontitis** was defined as follows: lack of healing, with well obturated RC, as of pathosis, the pre existing radiographic lesions remained the same size or increased in size, the presence of a clinical sign or symptom of periapical disease.
- **Controls:** subjects who had RCT accomplished with no signs or symptoms of disease after at least one year recall.
- **Analysis of genetic Polymorphisms:** The inside of the cheek was scrapped to collect DNA samples. The PCR for IL-1 β gene amplification was performed.

**Results:** A strong association was observed between PAP and the presence of genotype comprising at least one allele 2 of IL-1 polymorphism (the presence of polymorphism increased the risk of PAP seven fold compared to those without the polymorphism). A significant difference in the distribution of the polymorphic genotype among cases (70.6%) and controls (24.6%) The clinical implications are that potential endodontic patients can be screened for the IL-1 β genotype by analyzing DNA. Treatment modifications for those at higher risk may include inter appointment inter canal medications, closer monitoring and follow up or extractions.

**Discussion:** There is an association of IL-1β genotype with PAP. It is noted that the IL-1 β polymorphism associated with PAP is also known to correlate with IL-1β production.

**LOE :** 2
Title: Pain prevalence and severity before, during, and after root canal treatment: A systematic review

Authors: Pak et al.

Journal: JOE 2011; 37:429-437

Reviewer: Daniel Cassis, DDS

Purpose: To determine the influence of root canal treatment on pain prevalence and severity and estimate the prevalence and severity of pretreatment, treatment, and post treatment pain in patients receiving root canal treatment.

Materials & Methods:

- 5,517 articles were identified through search engines.
- 72 studies qualified for meta-analysis.
- L’Abbe plots were used to determine the influence of RCT on pain prevalence and severity.

Results: L’Abbe plots revealed that pain prevalence and severity decreased substantially after treatment. Prevalence of pain was 28% pretreatment, 24% 24 hrs after tx, and 11% 1-week post op. The severity of pain on a 100 point scale was 54 for pretreatment, 24 for 24hrs after tx and 5 for 1-week post op. They also found supplemental anesthesia was often required.

Discussion: The prevalence and severity of pain in patients decreased 24 hrs after RCT and decreased even further at 1-week post RCT.

LOE: 1
Title: Influence of EDTA on the active chlorine content of Sodium hypochlorite solutions when mixed in various proportions.

Author: Clarkson et al

Journal: JOE vol. 37, #4, April 2011 pg.538

Reviewer: Ferras Mashtoub, DDS

Purpose: The aim of this study was to measure the effect on the active chlorine content of NaOCl solutions of different concentrations after dilution with EDTA in different proportions.

Materials and Methods:

- 5 NaOCl solutions of different concentrations were mixed in specific proportions with a solution of EDTA.
- Changes in active chlorine content of the combined solutions were measured over time.
- The NaOCl solutions used were: Hypochlor 1% and 4%, Black and Gold bleach, Milton, White King all purpose bleach
- The EDTA solution used was Endosur, which is a 17% concentration and has a pH of 7.5.
- Combined solutions were 90% NaOCl/10% EDTA, 75%/25%, and 50%/50%.
- As a negative control, the Black and Gold bleach was also diluted with demineralized water instead of EDTA to measure the loss of active chlorine content due to dilution alone.
- Active chlorine content was measured by iodometric titration immediately before and after mixing, as well as 5,9,13, and 18 minutes after mixing the solutions.
- To determine the loss of active chlorine concentration, the researchers subtracted the total active chlorine concentration loss from the negative control (loss due to dilution alone) and the result represented the loss due to EDTA.

Results:

- All NaOCl solutions lost significant amounts of active chlorine content when mixed with EDTA.
- The loss was very sudden at the first titration and gradually decreased afterwards.
- Bleaches that contained surfactant (Hypochlor 1%, 4%, and White King all purpose bleach) were less prone to losing their active chlorine content
- The reaction between NaOCl and EDTA is exothermic

Discussion: A common practice in endodontics is to alternate rinses of EDTA and NaOCl. While both EDTA and NaOCl are important irrigants in their own right, it is important to keep the findings of this study in mind. When mixed, the NaOCl becomes significantly less effective. Clinically, it is important to be sure to dry the canal from one solution before introducing the other.

Conclusion: In order to preserve the effectiveness of sodium hypochlorite, one should avoid mixing it with EDTA.

LOE: 5
Title: Disinfecting oval-shaped root canals: effectiveness of different supplementary approaches

Author: Flavio R.F. et al

Journal: Journal of Endodontics, vol. 37, no. 4, p. 496

Reviewer: Christian Kecht, DDS

Purpose: To investigate the ability of different approaches to supplement the intracanal antibacterial effects of rotary NiTi instrumentation against *E. faecalis* populations in long oval root canals of extracted human teeth.

Materials and Methods:

- 54 extracted single canal mandibular incisors and maxillary second premolars
- Selected teeth had greater than 2.5:1 ratio between the buccolingual and mesiodistal dimensions at a level 5mm from the root apex
- Teeth instrumented to #25 hand file at apex, irrigated with 17% EDTA, irrigated with 2.5% NaOCl, and finally irrigated with 10% sodium thiosulfate to inactivate the NaOCl.
- Teeth immersed in trypticase soy broth, sterilized in autoclave for 20 min at 121°C, infected with *E. faecalis* strain ATCC 29212, and allowed to grow for 30 days at 37°C.
- 4 teeth split and examined under SEM to confirm bacterial colonization and biofilm formation
- Remaining 50 teeth had apical foramen sealed to recreate vapor lock effect of natural teeth and teeth mounted in silicone impression material
- External of teeth disinfected, WL determined, initial sample (S1) taken with paper points.
- Teeth instrumented with BioRaCe files to size 40/.04, irrigation with 2.5% NaOCl and 17% EDTA, washed with 10% sodium thiosulfate, and post-preparation sample (S2) taken.
- 20 teeth in passive ultrasonic irrigation/chlorhexidine group (PUI/CHX), 24 teeth in Hedstrom group, and 6 teeth with negative S1 samples excluded.
- PUI/CHX group: canals filled with 2.5% NaOCl and solution ultrasonicated for 1 min with #15 file and piezoelectric ultrasonic device 1 mm short of WL, then S3 sample taken. This was followed by filling canal with 0.2% chlorhexidine for 1 min (irrigation tip taken 3 mm short of WL). S4 sample taken.
- Hedstrom group: canals irrigated with 2.5% NaOCl, three short strokes performed on buccal and lingual walls with #40 Hedstrom files, and irrigated again.
- Polymerase chain reaction (PCR) used to identify *E. faecalis* in samples and statistical analysis performed

Results:

- For the PUI/CHX group, no significant difference (P=0.17) between S2 and S3 samples, and no significant difference (P=0.31) between S3 and S4 samples
- For the PUI/CHX group there was a significant difference (P=0.03) between S2 and S4 samples.
- For the Hedstrom group, no significant difference (P=0.65) between S2 and S3 samples.

Discussion: Number of negative cultures remained unaltered after additional Hedstrom filing. Although PUI did not significantly increase the incidence of negative cultures, the sequential effects of PUI and CHX final rinse led to a significant increase in the frequency of negative cultures.

Conclusion: Passive ultrasonic irrigation followed by CHX rinsing significantly reduced bacterial counts and the incidence of positive cultures after chemomechanical preparation of oval root canals.

LOE: 5