

Antimicrobial Effect of Pastes Used in Necrotic Primary Molars Therapy

Suarez C, Aguilar D, Chuc M, Irahuen V, Casanova E.

Autonomous University of Yucatan, Master in Children's Dentistry

Background

There are different techniques for the treatment of necrotic primary molars, with the aim of maintaining the primary dentition until its physiological exfoliation. The pulpectomy technique uses pastes from calcium hydroxide and iodoform to fill the canals. The residual sterilization and repair technique (LSTR), included in 2022 by the AAPD in the guide for the management of pulp lesions in primary teeth, introduces the use of antibiotic pastes without instrumentation, only placing the paste at the entrance of the canals.

LSTR is an alternative when pulpectomy is not viable due to pathological resorptions or advanced rhizolysis. It should be remembered that the success of root canal treatment depends directly on reducing or eliminating the endodontic microbiota of necrotic canals. Currently, there is little scientific evidence on the antibacterial effect of these pastes.

Purpose

The objective of this study is to evaluate *in vitro* the antibacterial activity of an antibiotic paste and a calcium hydroxide and iodoform paste (Ultrapex), against bacterial strains typical of necrotic primary molars.

Methods

The Kirby Bauer test was used to evaluate the antimicrobial effect of two pastes; one composed of tetracycline, chloramphenicol, zinc oxide and eugenol (CTZ) and Ultrapex paste, against bacterial strains present in necrotic pulps, including; *Enterococcus faecalis*, *Fusobacterium nucleatum*, *Porphyromona gingivalis* and *Prevotella intermedia*. A negative and positive control, chlorhexidine and bacterial medium were used, respectively. Under anaerobiosis criteria and after 72 hours of incubation, the inhibition halos were measured.

Results

The average of the measurements obtained was 57.75 millimeters for the plates with antibiotic paste CTZ and 17.5 millimeters for the plates with chlorhexidine. The Ultrapex paste did not form inhibition halos.

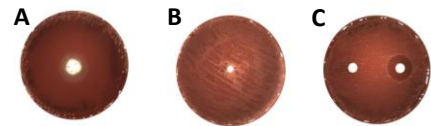


Figure 1. (*P. intermedia*). (A) CTZ. (B) Ultrapex. (C) chlorhexidine.

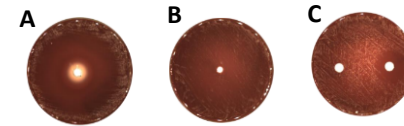


Figure 2. (*F. nucleatum*). (A) CTZ. (B) Ultrapex. (C) chlorhexidine.

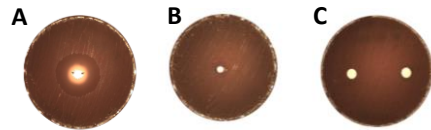


Figure 3. (*E. faecalis*). (A) CTZ. (B) Ultrapex. (C) chlorhexidine.

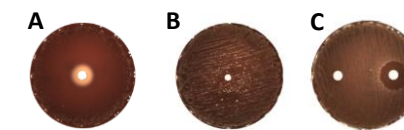


Figure 4. (*P. gingivalis*). (A) CTZ. (B) Ultrapex. (C) chlorhexidine.

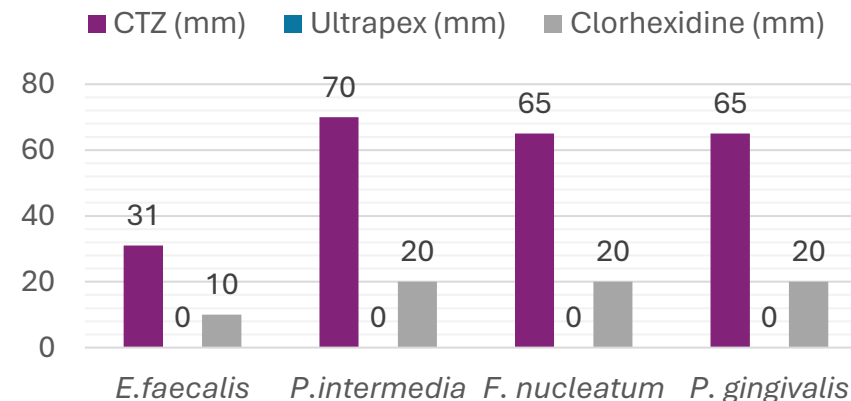


Figure 5. Shows the average diameter per bacteria, of the inhibition zones obtained on plates with CTZ paste, Ultrapex paste and chlorhexidine.

Discussion

- This research demonstrated that CTZ antibiotic paste has satisfactory results against different strains representative of necrotic primary molars, even with more resistant strains such as *E. faecalis*. Other studies evaluated the antimicrobial effects of a paste prepared with tetracycline, thiamphenicol, and zinc oxide to analyze various bacterial strains, including *F. nucleatum*.
- The results also demonstrate the effectiveness of the antibiotic paste. Knowing the pathogenic microbiota present in the root canal system is essential for developing an effective endodontic therapy strategy.

Conclusion

The antibiotic paste presented high values of bacterial inhibition against bacteria prevalent in necrotic pulps. The Ultrapex paste showed no antimicrobial effect, confirming only its antiseptic properties.

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