Abstract

Background

This research focused on the effects of low electric current (μE)-assisted sonic agitation of sodium hypochlorite on Enterococcus faecalis infected human root dentin.

Methods

Extracted human canine roots were instrumented, sterilized, and experimentally contaminated with E. faecalis. After incubation for 21 days, the presence of the biofilm was confirmed by scanning electron microscopy (n = 3). Roots were randomly divided into seven groups according to decontamination procedures: G1: no treatment; G2: sterile saline; G3: 5.25% sodium hypochlorite; G4: passive ultrasonic irrigation; G5: EndoActivator (Dentsply Tulsa Dental Specialties, Tulsa, OK) agitation (EA); G6: μE agitation; and G7: μE-assisted sonic agitation. Fixed μE amperage and intensities were applied in G6 and G7. Following microbial sampling, bacterial colonies were counted using the direct plating method.

Results

Biofilm was not eradicated in any sample. The μE-assisted sonic agitation of sodium hypochlorite revealed the lowest cfu values (p<0.05), whereas there were no significant differences among the passive ultrasonic irrigation, EndoActivator and μE agitation alone (p>0.05).

Conclusions

Based on available evidence, the following conclusions were drawn: The μE-assisted sonic agitation increased the antibiofilm efficiency of sodium hypochlorite than passive ultrasonic irrigation and EndoActivator. The μE-assisted sonic agitation on 5.25% sodium hypochlorite is not capable to eradicate biofilms at 10mA energy level in 60s.