Original Article

Hypochlorite solution for root canal irrigation that lacks a chlorinated odor

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ABSTRACT

Objectives: This is an *in vitro* study to develop a formulation of a hypochlorite solution for root canal irrigation that lacks a chlorinated odor. The antibacterial effect, tissue dissolution efficacy, and the cytotoxicity of the solution were assessed in cell culture and were compared with those of commercial sodium hypochlorite (NaOCl) solutions. **Materials and Methods:** Trichloroisocyanuric acid (TCA) was used as the source of hypochlorite ions in solution. All required properties of the NaOCl irrigant were evaluated and compared with those of original 2.5% NaOCl solutions currently in use. **Results:** Our results revealed that a TCA 3.5% + 1/6 Buffer-1 solution passed the short-term stability test. Moreover, no odor of chlorine gas was detected by three independent observers. The hypochlorite ion content and pH were stable over an incubation period of 4 weeks. The new solution did not differ from commercial products in terms of the dissolution property on bovine pulpal tissue ($P > 0.05$). Moreover, the antibacterial effect of this solution on *Enterococcus faecalis* did not differ from that of the commercial products ($P > 0.05$). In addition, our biocompatibility analysis demonstrated no difference among the tested solutions ($P > 0.05$). **Conclusions:** According to the results of all properties tested, TCA 3.5% + 1/6 Buffer-1 could be considered an option for NaOCl irrigation with the benefit of no detectable chlorine odor.

Key words: Hypochlorite solution, lacks a chlorinated odor, root canal irrigant

INTRODUCTION

Elimination of inflammatory or necrotic pulpal tissue is the primary aim of root canal treatment. Sodium hypochlorite (NaOCl) is extensively used as a root canal irrigant for root canal disinfection. Antibacterial infection and necrotic pulpal tissue dissolution are the two main purposes of root canal irrigants.[1]

Studies by Byström and Sundqvist[2,3] and Byström and Sunvqvist[4] confirmed the use of NaOCl as an effective root canal irrigant. NaOCl can reduce bacterial infection better than normal saline solution (NSS). The efficiency of irrigation can be increased by adding ethylenediaminetetraacetic acid (EDTA) for smear layer elimination. NaOCl penetrates deeper

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