



EFFECT OF TIME ON DISINFECTION OF GUTA-PERCHA CONES WITH SODIUM HYPOCHLORITE: ORIGINAL STUDY

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ABSTRACT

The success of endodontic treatment is to eliminate as much bacteria as possible, reaching a point where the organism is able to remain free of the infectious process. Guta-percha cones are one of the most biocompatible dental materials, not interfering in the repair process that occurs after obturation, are the most used means in obturation of the root canal and, therefore, responsible for preventing microorganisms from penetrating in the root canal after obturation initiating a new infectious process. The objective of the present study was to investigate the efficacy of sodium hypochlorite in the concentration of 2.5 % in the decontamination of gutta-percha cones contaminated with microorganisms after their manipulation. Contaminated cones were treated by immersion in 2.5% sodium hypochlorite solution for 2, 3, 4 and 5 minutes and rinsed with sterile distilled water. The treated cones were inserted into petri dishes with the culture medium nutrient agar to verify the existence and proliferation of microorganisms. The sodium hypochlorite solution after the 4 minute exposure period, eliminated all microorganisms, making the cones safe for use.

KEYWORDS

guta-percha cones, sodium hypochlorite, decontamination.

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Introduction

Endodontic treatment has the purpose of eliminating the largest

number of bacteria existing in the root canal, reducing them to a level that the organism can by itself combat them, and calls for the

development of an infectious process [1,2]. The obturation process has as main objective to prevent the entry of new microorganisms into the root canal [2,3].

Gutta-percha is one of the most biocompatible materials among those used in dentistry, not interfering with the tissue repair process that forms after root canal filling. For this reason they are the most used material for root canal filling [3,4].

According to the literature, gutta-percha cones are composed basically of 19.0 % to 20.0 % gutta-percha, 59.0 % to 75.0 % zinc oxide and the remainder of radiopacifiers (barium sulfate), waxes, coloring agents, antioxidants and metal salts [4]. The presence of zinc oxide confers antibacterial activity on the cones of gutta-percha and for this reason, several authors defend the need for disinfection prior to the obturation stage [5].

The susceptibility of the gutta-percha cones to be contaminated, we then take care of the time required for sodium hypochlorite, at the concentration of 2.5 % to eliminate these microorganisms, making the use of these cones safe to maintain the success of endodontic treatment [6].

In view of this premise, the objective of this work was initially to verify these characteristics, after the first bacterial culture realized in the cones of gutta-percha, we verified the growth of microorganisms in the body of gutta-percha cones tested.

Materials and Methods

The previous decontamination of gutta-percha cones when used during endodontic treatment in order to prevent contamination of the canal system is quite controversial in endodontics. However, the most used method according to the literature is the immersion of gutta-percha cones in sodium hypochlorite.

Disinfection medium of Guta percha Cones

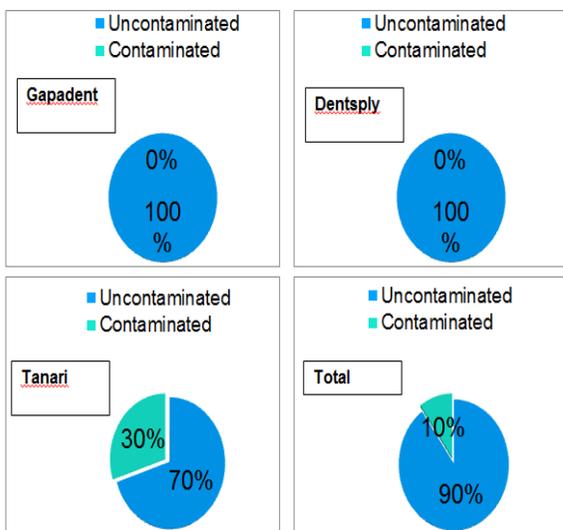
Sodium hypochlorite is the most commonly used disinfection agent in endodontics. This occurs due to factors such as its bactericidal properties, organic material solvent, cytotoxicity, allied to its low cost. For this work were used 150 cones of gutta-percha from three different brands, separated into 15 different groups and immersed in sodium hypochlorite, according to table 01:

Table 1. Groups of gutta-percha cones from three different brands that were immersed in sodium hypochlorite.

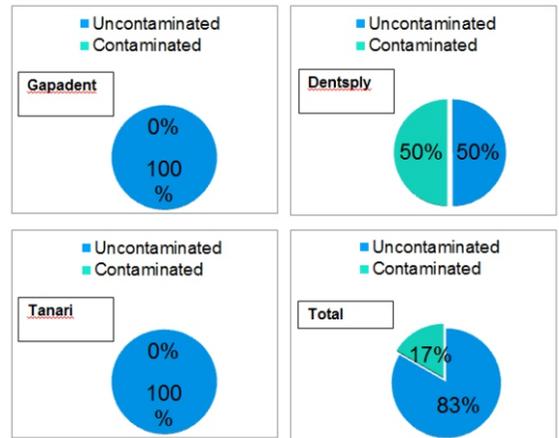
	2 minutes	3 minutes	4 minutes	5 minutes	Control
Gapadent	I	IV	VII	X	XIII
Dentsply	II	V	VIII	XI	XIV
Tanari	III	VI	IX	XII	XV

Results

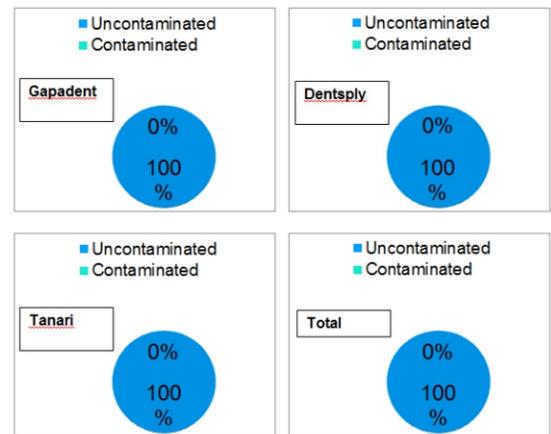
- 2 minutes



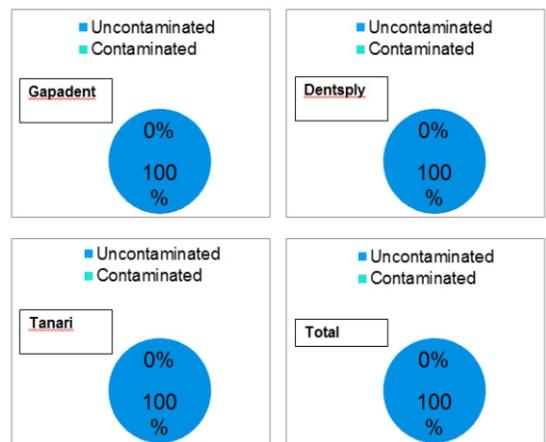
- 3 minutes



4 minutes



5 minutes



Discussion

The use of sodium hypochlorite for rapid decontamination of gutta-percha cones was proposed by Senia et al. (1975) (apud Silva et al., 2005 [1]). These authors demonstrated that gutta-percha cones contaminated with Staphylococcus epidermis, Corynebacterium xerosis, Escherichia coli and Enterococcus faecalis were decontaminated after immersion in Clorox® (5.25% sodium hypochlorite) for 30, 45 and 60 seconds, respectively.

In the present study, we initially demonstrated that new gutta-percha cones removed from the box may be contaminated by microorganisms and therefore it is not safe to use them without decontamination first, otherwise the chances of in-success of the endodontic treatment. The practicality, due to the use of sodium hypochlorite during the irrigation phase in the endodontic treatment, prevents the Dentist from having to buy and use two substances. It is the most used

disinfection medium in endodontics [7-10]. This occurs due to factors such as its bactericidal properties, organic solvent, cytotoxicity, coupled with its low cost [11-13].

In addition, we cannot associate sodium hypochlorite with chlorhexidine because the interaction between them results in parachloroaniline, a carcinogenic precipitate [14-16]. This precipitate has amber coloration and, according to several authors, may generate an undesirable chromatic effect on the dental crown [17,18]. Finally, a careful evaluation of the results, especially groups VI, IX and XII, was carried out to determine if there was or not contamination of the cones, due to the presence of bacterial colonies.

Conclusion

Guta-percha cones are susceptible to contamination by microorganisms, necessitating their decontamination before use in endodontic treatments. The decontamination of the cones can be carried out using sodium hypochlorite, being necessary the permanence of the gutta-percha organisms in the solution of sodium hypochlorite in the concentration of 2.5 % for at least 4 minutes for the complete disinfection of these making safe its use.

Conflict of interests

There is no conflict of interest between authors.

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