

Plan Overview

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Title: Effect of a new bleaching agent for professional use containing hexametaphosphate and fluoride on bleaching efficacy, trans-amelodentinal diffusion, microhardness and cytotoxicity: an in vitro study

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Funder: São Paulo Research Foundation (fapesp.br)

Funding opportunity number: 59131

Template: Digital Curation Centre

Project abstract:

This study aims to evaluate in vitro the addition of sodium hexametaphosphate (HMP) at a concentration of 1% associated with 0.1% sodium fluoride (NaF) and 35% hydrogen peroxide (PH) on: diffusion trans-amelodentary; color change; surface hardness in longitudinal section and trans-amelodentary cytotoxicity. The methodologies applied will be: 1) 35% hydrogen peroxide (PH); 2) PH associated with 0.1% NaF (PH / F); 3) PH associated with 1% HMP (PH / HMP); 4) PH associated 0.1% NaF associated 1% HMP (PH / F / HMP) and 5) HP Blue 35% (FGM - Odontological Products: HP). The bleaching gel will be applied once in 3 sessions of 7 days each, after the treatment period the color change will be evaluated by quantified reflection spectrophotometry, diffusion of the quantified peroxide, where the specimens will be positioned in an artificial pulp chamber (CPA) containing acetate buffer solution for evaluating optical density in a spectrophotometer. The initial surface hardness and after (final) treatment, and in longitudinal section, will also be determined. For cytotoxicity analysis, the specimens will be adapted in the CPAs, and the products of diffusion of the bleaches with culture medium will be applied on MDPC-23 odontoblastoid cells for 1 hour. Variables that present normal and homogeneous distribution will be subjected to analysis of variance ($p < 0.05$). Otherwise, they will be submitted to the Kruskal-Wallis test ($p < 0.05$). The multiple comparison test will be Student-Newman-Keuls.

Start date: 01-03-2021

End date: 03-30-2023

Last modified: 10-03-2023

Copyright information:

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Effect of a new bleaching agent for professional use containing hexametaphosphate and fluoride on bleaching efficacy, trans-amelodentinal diffusion, microhardness and cytotoxicity: an in vitro study

Color values; hydrogen peroxide trans-amelodentinal diffusion; hardness values of enamel/dentin; trans-amelodentinal cytotoxicity.

Color data: color values of enamel/dentin samples using the CIE L*a*b* color system. The change values of L* (ΔL), a* (Δa) and b* (Δb) will be calculated. The total color change will be calculated using the formula: $\Delta E = [(\Delta L)^2 + (\Delta a)^2 + (\Delta b)^2]^{1/2}$. Trans-amelodentinal diffusion of the hydrogen peroxide determined by the colorimetric reaction of hydrogen peroxide, and leucocrystalline violet, catalyzed by the enzyme peroxidase; mesuared by absorbance (596 nm) and expressed in $\mu\text{g/mL}$. Enamel surface hardness data: Knoop diamond indenter under 25 g for 10 s in each enamel/dentin disk; and cross-sectional hardness with a load of 5 g for 10 s, and at 5, 10, 15, 20, 25, 30, 40, 50, 60, 80, 100, 120, 140, 160 and 180 μm of the surface. Trans-amelodentinal cytotoxicity: cell viability, alkaline phosphatase and mineralized nodules from immortalized cells of MDPC-23 odontoblastic lineage.

Graphic, figures, tables and Microsoft Excel spreadsheet. The data can be accessed through the UNESP Repository.

In vitro study. There are no ethical issues involved.

As a result of this project, articles will be published. Copyright will be determined jointly with the members of our research group.

The data will be stored on external hard drives, SSD on laptop, Microsoft OneDrive, and UNESP repository.

All researchers involved in the project will have access to the data, but only the researcher responsible and coordinator will edit and update the backup.

All data will be kept indefinitely. There is no validity. The data can be reused to validate research findings, conduct new studies or to teach.

The data will be storage in the UNESP repository, indefinitely, with no costs for data storage. The data will be prepared and stored by the project participants during the development of the study.

The data will be shared with any interested researcher through the UNESP repository, after publication in international journals; in any situation, prior identification (Country, Institution, Researcher).

There are no restrictions after publishing the data in international journals. In cases of use for research or publications, a partnership and participation agreement must be signed.

The data acquired during the project will be managed by the responsible researcher and the project coordinator.

Graphic, figures, tables and Microsoft Excel spreadsheet as well as through publications. The data can be accessed through the UNESP Repository.
