



EVALUATE THE VARIATION OF THE PH BETWEEN TWO MATERIALS FOR INTERNAL BLEACHING (IN VITRO) IN UNIRRADICULAR PIECES RELATED TO THE EXTERNAL CERVICAL REABSORPTION.

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ABSTRACT **SUMMARY:** The objective of this research is evaluating the PH variation between two materials for internal bleaching, in 60 uniradicular pieces and their relationship with external cervical resorption at the time of application. Two types of internal materials were used, Whiteness HP "35%" (FGM) and Borosan (Lamosan). This research was complying with the manufacturer's instructions in each of the procedures. Two groups were formed, to work with 30 pieces depulped with sodium perborate and hydrogen peroxide, for the pH measurement was used a Digital Metro Ph which evaluated at the beginning, at that moment, 24 hours, 48 hours, 7 days, 14 days; the data obtained were analyzed statistically by Student's T and chi-square. It was observed that the acid value in hydrogen peroxide and sodium perborate acquired an alkaline value taking into account that over time the values intensified. The increase in acidity had a greater influence with an external cervical resorption.

KEYWORDS :

INTRODUCTION

Over time esthetics has been considered an important factor in the development of society and for this reason people hope to have teeth that harmonize an appropriate smile, especially non-vital dental pieces that have changed their coloration.

According to advances in Odontology¹. He mentioned that the first methods to bleaching were the chemical agents calcium chloride, sodium bicarbonate, acetic acid and sulfuric acid but they were manufactured only in non-vital teeth. After he put "30%" hydrogen peroxide some cotton with heat.

Equally² He quoted Prinz, who in 1924 used a saturated solution of hydrogen peroxide and sodium perborate, activated by light, this treatment was carried out in a single appointment; until Spas, was the one who innovated with a new method of internal whitening using sodium perborate and distilled water by placing it temporarily in the pulp chamber of non-vital teeth.

He determined that changes in pH in dental tissue were influenced by calcium hydroxide³; leaving areas of resorption, and as a result I observe an alkaline pH with exposed dentin. He mentioned Friedman's experiment with 58 teeth internally clad with hydrogen peroxide, found an incidence of external root resorption for "7%" approximately⁴.

Consequently⁵ He cited dental bleaching as a treatment to improve the aesthetics of pieces with dyschromias in which a process of oxidation of the compounds that pigment the tooth is development. That was the origin of the pigmentations in non-vital pieces⁶.

They indicated that in a devitalized piece⁷, the darkening occurs due to the degradation of the tissue during the necrosis process, contamination of the pulp cavity and the ducts, hemorrhage post trauma, errors committed during the endodontic treatment. Where the blood vessels were broke and erythrocytes invade the dentinal tubules. The hemolysis of these erythrocytes produces a black pigment (iron sulfate) that darkens the tooth.

In the same sense⁸ the technique of internal bleaching has been possible to use intracamer materials with hydrogen peroxide and sodium perborate.

However⁹⁻¹⁰ the mechanism of action materials and these act on the hard tissues of the tooth, causing the pigments to be degraded in simple structures to be eliminated. For that reason¹¹ of the researchers studied the concentration of internal thinning materials that favors pH facilitating external cervical resorption.

The external cervical resorption was defining as a pathological entity from a chronic inflammation¹²⁻¹³ of the dental tissues that starts under

the epithelial attachment and clinically this is a pink do on the crown of the tooth. The Cement enamel union has a condition that favors the resorption, is at the proximal level.¹⁴ In addition to the acidic pH which activates proteolytic enzymes collagenases and hydrolases which remove cement and dentin initiating external cervical resorption. The pH values of these materials are an important factor during dental treatment, it is important that professionals know the effects on tooth structure to minimize risks and ensure treatment.¹⁵

MATERIALS

60 uniradicular pieces depulped, 30 they worked with hydrogen peroxide and 30 with sodium perborate.

The uniradicular dental pieces are selected, free of caries, without fractures or fissures without restoration. Second, the teeth were made the accesses. Then, teeth were indicated 3 mm under cemento-enamel junction in mesial and distal. Once, the teeth were cut with a fine-grained double-sided diamond disk and micromotor NSK. Sodium Perborate was diluted the 60 ml sachet with distilled water, and then the perborate was placed in the dental crown.

Hydrogen peroxide was made according to the manufacturer's instructions: Thickening flask was homogenized the contents and the jars put in vertical to dispense the drops. The gel was shaken for approximately 40 seconds until a viscous and firm gel was obtained. The suggested ratio is 3 drops of Hydrogen Peroxide for 1 thickener and finally placed inside the crown of the tooth.



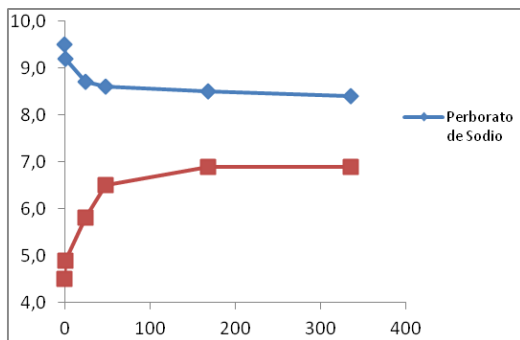
Figure 1. measuring the crown of the teeth



Figure 2 Apply Sodium Perborate

Table1. pH variation according to time

GROUP	Initial pH	pH 1h	pH 24h	pH 48h	pH 7d	pH 14 d
Sodium Perborate	9.5	9.2	8.7	8.6	8.5	8.4
Hydrogen peroxide	4.5	4.9	5.8	6.5	6.9	6.9

**Figure 5: Variation of pH as a function of time per group.**

Additionally, the Student t and chi square statistical tests were performed at a significance of 0.05. The Student t test determined that there was no significant difference in the initial value per group ($p = 0.68$), but there was a significant difference in the final assessment by group ($p = 0.03$).

The variation in the measurement was calculated; subtracting the final value of the initial in each case, being able to corroborate that the most important variations were in the group in which hydrogen peroxide was used was 0.43 mm whereas in the group in which sodium perborate was applied the variation was 0.17 mm, indicating less resorption.

The qualitative assessment allowed establishing if there were changes in the different samples, determining that 43.3% of the cases treated with hydrogen peroxide produced changes in the reabsorption, while in the group in which the perborate was used alone 16.7% showed this change. The chi-square test estimated that there is dependence on the presence of resorption with the type of clearing agent.

Discussion

The pH of sodium perborate at the beginning is 9.5, which decreased to 8.4 after 14 days. Coinciding Riehl got pH 9.4. It is beginning to stabilize after 7 days. In addition to agreeing with Leonardo since at 14 days similar data of pH value were obtained 4.2

The external cervical resorption by sodium perborate starts at 1.83 and a final value of 1.67 with an average variation of 0.17. Coincidence with 16- 17 the alkaline pH factor would not have much influence on the etiology of cervical external resorption. Peroxide Ph started 4.5 and 6.9 matches Sánchez R^{13,2} obtained from 6 to 6.4 stabilizing in 14 days.

The hydrogen peroxide started 1.77 and a final value of 1.33 with an average variation of 0.43 coinciding with (Ramos, 2007)¹⁸ 35% of hydrogen peroxide causes RCE by extravasation of hydrogen.

RESULTS

The results obtained in the study were between two groups, the one group worked with sodium perborate and the other with hydrogen peroxide the pH measurement was made at the beginning, at the time, 24 hours, 48 hours, 7 days, 14 days, the results indicated that the hydrogen peroxide was increasing its value becoming neutral on day 14 however the sodium perborate was decreasing the value approaching a neutral pH value, with respect to the external cervical resorption was obtained greater resorption with hydrogen peroxide than with sodium perborate, concluding that the acidic pH and the exposure time make it an external cervical resorption factor.

CONCLUSIONS

Any procedure that has a variation in pH can lead to a risk in the tissues, however minimal it may be, in the clarification in non-vital dental pieces we observe the external cervical resorption caused by the acid value of hydrogen peroxide during the first measurements, the same as had reciprocity with the resorption in the case of sodium perborate and its basic values did not show a major change at the cervical level.

The two clearing agents during the measurement values in time tried to reach a stability point 7 according to the pH scale, not being able to control the resorption.

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