

Dental structures receiving at-home bleaching

Ankit Pandey, Tanay Shukla

Pandey A, Shukla T. Dental structures receiving at-home bleaching. *Dent Case Rep.* 2022; 6(5):14-15.

ABSTRACT

Dental erosion is a multifactorial disorder that may be brought on by an unknown acid source or be idiopathic in origin. Some bleaching agents have pH values that are below the threshold, which can alter the mineral composition of the enamel. Studies have revealed that using low quantities of hydrogen or carbamide peroxide to whiten teeth at

home has no appreciable negative effects on the surface qualities of the enamel and dentin. Most erosion investigations involved in vitro experiments. Even while the procedure could result in adverse reactions such as sensitivity and gingival irritation, these normally go away after the procedure is over

Key Words: Peroxide; Dental aesthetics; Tooth bleaching; Enamel; Dentin; Erosion; Abrasion

INTRODUCTION

In contemporary society, dental aesthetics are becoming more significant. Many patients today are looking for personal fulfillment, which is driving up demand for a pretty smile. One of the most common cosmetic procedures available in dentist offices is tooth whitening [1]. There are numerous methods and products for essential tooth whitening that differ in concentration and the kind of end products released [2,3]. The dentist can carry out the bleaching techniques in the office, or the patient can do it themselves at home under their own supervision.

Overall, when peroxide-containing substances are applied to an enamel surface, they decompose into water and oxygen, which pass through the enamel and cause the oxidation and reduction of organic pigments, which are primarily found in dentin, which reduces or removes the discoloration [4]. The most popular method is custom-made bleaching trays used at home [5,6]. This procedure's applicability, shorter chair time, safety, and low incidence of tooth sensitivity are its benefits [7]. Using specialized trays filled with hydrogen peroxide gels or low-concentration carbamide gels (10%–22% or 3.4%–7.5%), patients bleach their teeth at home under supervision for a few hours each day [2,5]. The most common side effects of tray bleaching systems are gingival irritability and tooth sensitivity, which may be related to the tray's shape or the bleaching agent's concentration.

EROSION AND ABRASION RELATED TO TOOTH BLEACHING

The loss of hard dental tissues over time as a result of abrasion and

erosion is known as tooth wear [8]. Dental abrasion is produced by oral habits and the use of abrasive materials, such as abrasive toothpaste, while dental erosion is the permanent loss of tooth substance caused by a chemical process without the presence of microorganisms. Despite the fact that these processes can happen separately or jointly, erosion is frequently the dominant force. It has been hypothesized that the pH on the enamel surface needs to drop below 5.5 for the demineralization of the enamel to occur [9].

Dental erosion is a multifactorial disorder that may be brought on by an unknown acid source or be idiopathic in origin [10]. The pathogenesis of dental erosion is linked to a number of acids, including some that are frequently found in the human diet, such as acidic food and soft drinks; or those originating in the stomach, such as gastric acid from regurgitation or reflux; and some drugs [9]. Some bleaching agents have a pH that is lower than ideal, which can lead to changes in the enamel's mineral composition, causing the enamel to become more porous and prone to erosion [11]. When the bleaching agent and tooth surface are in contact for longer periods of time, these changes may be more pronounced [12,13].

SAFETY AND TOLERABILITY

The safest and most effective way to whiten teeth at home is with 10% carbamide peroxide applied to a bespoke tray; this method also has the advantage of causing less tooth sensitivity and gingival sensitivity [5]. Although these side effects are possible, typically go away after therapy [14-17]. Either the tray's design or the bleaching agent's concentration could be to blame for gingival irritation. This side effect is typically resolved by pausing therapy for 24 hours-48

Department of Biotechnology, IBST, Shri Ramswaroop Memorial University, Lucknow, UP, India

Correspondence: Ankit Pandey, Department of Biotechnology, IBST, Shri Ramswaroop Memorial University, Lucknow, UP, India, E-mail: ankit_p@gmail.com
Received: 02 Sep, 2022, Manuscript No. puldcr-22-5597, Editor assigned: 05 Sep, 2022, Pre QC No. puldcr-22-5597 (PQ), Reviewed: 19 Sep, 2022, QC No. puldcr-22-5597 (Q), Revised: 21 Sep, 2022, Manuscript No. puldcr-22-5597 (R), Published: 24 Sep, 2022, DOI: 10.37532. puldcr-22.6.5.14-15.



This open-access article is distributed under the terms of the Creative Commons Attribution Non-Commercial License (CC BY-NC) (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits reuse, distribution and reproduction of the article, provided that the original work is properly cited and the reuse is restricted to noncommercial purposes. For commercial reuse, contact reprints@pulsus.com

hours or adjusting the tray [18]. Although tooth sensitivity might make a patient uncomfortable, it is a temporary side effect that does not persist longer than 24 hours and seldom prompts a patient to stop receiving therapy [19]. The majority of sensitivity symptoms appear within the first two weeks of therapy and may be brought on by the glycerin or other vehicle used to transport the active ingredient, which dehydrates teeth and makes it easier for the active ingredient to penetrate dental tissues, resulting in reversible pulpitis [20]. If there is a gingival recession with exposure to cementum and/or dentin, the risk of tooth sensitivity increases [21]. This negative impact can be minimized by mixing the bleaching chemical with potassium nitrate and fluoride. Fluoride application prior to the bleaching procedure is another technique that has been proven to be successful in lessening the intensity of tooth sensitivity. Additionally, in order to lessen any post-treatment tooth sensitivity, producers have produced at-home bleaching gels that contain fluoride.

CONCLUSION

Home tooth whitening products based on hydrogen or carbamide peroxide have no negative effects on the characteristics of enamel and dentin. Aside from the fact that artificial saliva is an effective medium for reversing the potential mineral loss associated with bleaching treatment in vitro, at-home tooth bleaching agents based on hydrogen or carbamide peroxide have no clinically relevant effect on enamel mineral loss caused by erosion or abrasion.

REFERENCES

- Kihn PW. Vital tooth whitening. *Dent Clin North Am.* 2007;51(2): 319-331.
- Matis BA, Cochran MA, Eckert G. Review of the effectiveness of various tooth whitening systems. *Oper Dent.* 2009;34(2):230-235.
- Hasson H, Ismail AI, Neiva G. Home-based chemically-induced whitening of teeth in adults. *Cochrane Database Syst Rev.* 2006; 4:CD006202.
- Meireles SS, Heckmann SS, Santos IS, et al. A double blind randomized clinical trial of at-home tooth bleaching using two carbamide peroxide concentrations: 6-month follow-up. *J Dent.* 2008;36(11):878-884.
- Matis BA, Cochran MA, Eckert GJ, et al. In vivo study of two carbamide peroxide gels with different desensitizing agents. *Oper Dent.* 2007;32(6):549-555.
- Armênio RV, Fitarelli F, Armênio MF, et al. The effect of fluoride gel use on bleaching sensitivity: a double-blind randomized controlled clinical trial. *J Am Dent Assoc.* 2008;139(5):592-597.
- Li Y, Lee SS, Cartwright SL, Wilson AC. Comparison of clinical efficacy and safety of three professional at-home tooth whitening systems. *Compend Contin Educ Dent.* 2003;24(5):357-360.
- Litonjua LA, Andreana S, Bush PJ, Cohen RE. Tooth wear: attrition, erosion, and abrasion. *Quintessence Int.* 2003;34(6):435-446.
- O'Sullivan E, Milosevic A. UK National Clinical Guidelines in Paediatric Dentistry: diagnosis, prevention and management of dental erosion. *Int J Paediatr Dent.* 2008;18:29-38.
- Lussi A, Hellwig E, Ganss C et al. Dental erosion. *Oper Dent.* 2009;34(3):251-262.
- Bistey T, Nagy IP, Simó A, et al. In vitro FT-IR study of the effects of hydrogen peroxide on superficial tooth enamel. *J Dent.* 2007;35(4):325-330.
- Mondelli RF, Azevedo JF, Francisoni PA, et al. Wear and surface roughness of bovine enamel submitted to bleaching. *Eur J Esthet Dent.* 2009;4(4):396-403.
- Grobler SR, Majeed A, Moola MH. Effect of various tooth-whitening products on enamel microhardness. *SADJ.* 2009;64(10):474-479.
- Cibirka RM, Myers M, Downey MC, et al. Clinical study of tooth shade lightening from dentist-supervised, patient-applied treatment with two 10% carbamide peroxide gels. *J Esthet Dent.* 1999;11(6):325-331.
- Barnes DM, Kihn PW, Romberg E, et al. Clinical evaluation of a new 10% carbamide peroxide tooth-whitening agent. *Compend Contin Educ Dent.* 1998;19(10):968-972.
- Haywood VB. Current status of nightguard vital bleaching. *Compend Contin Educ Dent Suppl.* 2000;28:S10-S17.
- dos Santos Medeiros MC, de Lima KC. Effectiveness of nightguard vital bleaching with 10% carbamide peroxide - a clinical study. *J Can Dent Assoc.* 2008;74(2):163.
- Haywood VB, Heymann HO. Nightguard vital bleaching: how safe is it? *Quintessence Int.* 1991;22(7):515-523.
- Heymann HO, Swift EJ, Bayne SC, et al. Clinical evaluation of two carbamide peroxide tooth-whitening agents. *Compend Contin Educ Dent.* 1998;19(4):359-362.
- Pohjola RM, Browning WD, Hackman ST, et al. Sensitivity and tooth whitening agents. *J Esthet Restor Dent.* 2002; 14(2):85-91.
- Suliaman MA. An overview of tooth-bleaching techniques: chemistry, safety and efficacy. *Periodontol* 2000. 2008;48:148-169.