



REVIEW ARTICLE

DENTAL BLEACHING, WHICH IS THE MOST EFFECTIVE TECHNIQUE? A REVIEW

¹Guilherme Guimarães Murad, ¹Amalia Rossi Dourado, ¹Lany Fiorin,
^{1,2}Patrícia Garani Fernandes, ^{1,2}Leandro Moreira Tempest, ^{1,2}Taylane Soffener Berlanga de
Araújo, ^{1,2}Elias Naim Kassis and ^{2,*}Idiberto José Zotarelli Filho

¹University Center North Paulista (Unorp) - São José do Rio Preto – SP, Brazil.

²Post Graduate and Continuing Education (Unipos), Street Ipiranga, 3460,
São José do Rio Preto SP, Brazil 15020-040

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*Corresponding author

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ABSTRACT

Background: The tooth whitening has been proposed long in dentistry, but in recent years the emphasis of the media in creating a standard of beauty increasingly clear teeth this has gained a huge demand in offices, because it is a technical conservative that returns the smile the desired beauty. **Objective:** The objective of this study was to analyze through the literary finds the best whitening cosmetic treatment, home and / or office and guide the professional and choosing the best whitening technique and control in reducing sensitivity caused by bleaching. **Methods:** For the identification of studies in this review study, carried OUT A detailed search strategy for Medline, Pubmed, Embase, Ovid and Cochrane Library in the years 1989 - 2016, as well as books and related to the topic magazines. **Discussion:** Nowadays it created a new smile pattern, the search for white teeth has been increasingly sought after day for greater acceptance as a standard of beauty. With all the information nowadays these bleaching techniques were more efficient when supervised by a trained professional. **Conclusion:** Both techniques are excellent when well conducted by professional and well educated to the patient, thus enabling treatment satisfaction for the patient and the professional.

INTRODUCTION

The quest for aesthetics is growing every day more in the context of our society, the current standard of beauty for society appreciated in view of a dynamic and demanding society with its presentation, therefore the tooth whitening is now a treatment huge demand (Luque-Martinez et al. , 2016; Schroeder et al. , 2015). Tooth bleaching has been proposed long in dentistry, but in recent years the media's emphasis on creating a standard of beauty increasingly clear teeth this has gained a huge demand in offices, because it is a conservative technique returns to the desired smile beauty (Luque-Martinez et al. , 2016). For this, there is the bleaching technique in office (office) where treatment can be performed on the made exclusively by professional office and the home use where professional advises the patient and depends on the correct cooperation of the same (Schroeder et al. , 2015; Andrade, 2005). To carry out this treatment should be a proper diagnosis and to identify the cause of the dental darkening because its etiology is fundamental for a good prognosis. Some authors showed some methodologies for better bleaching treatment, this study aims to compare through a literature review guide

the professional to the best treatment (Luque-Martinez et al. , 2016). The objective of this study was to analyze through the literary finds the best whitening cosmetic treatment, home and / or office and guide the professional and choosing the best whitening technique and control in reducing sensitivity caused by bleaching.

METHODS

For the identification of studies in this review study, carried OUT A detailed search strategy for Medline, Pubmed, Embase, Ovid and Cochrane Library in the years 1989 - 2016, as well as books and related to the topic magazines. They Were used the descriptors: Aesthetics, Dental Bleaching and Systematic Review. Analyzed studies systematic review, meta-analysis, randomized controlled cases, nonrandomized clinical cases and opinion articles que Addressed the term tooth whitening. The date Were Analyzed, correlated to the discussion of the results highlighted in the literature.

Continuous predictors: The continuous predictors Were types of dental bleaching.

Response predictor: The response was predictor tooth whitening score, enamel structure and sensitivity.

LITERATURE REVIEW

Changing the enamel structure: The loss of mineral structure after application of bleaching agents used for this 28 standardized upper central incisors, and the bleaching agent was subjected to the buccal part thereof for electron microscopy analysis sweep. The agents with acidic pH resulted in major changes and mineral loss, bleaching with the same pH no influence over repeated sessions (Araújo *et al.*, 2015). Another study of literature review found bleaching agents and their concentrations in the alteration of dental morphology. The tooth structure when subjected to conditioning at high concentrations (hydrogen peroxide 35%) has a larger altered morphology depending on their repetitions, the conditioned tooth structure to an agent with lower concentration, the smaller the change in their morphology as saliva acts after as buffer effect remineralizing and with little loss of tooth structure. Completing more the cumulative effect of these treatments may be what actually leads to a greater loss of this (Portolani Junior, 2005) structure.

Sensibility: Machado *et al.* (2010) conducted a study "in vivo" to observe the 35% hydrogen peroxide not photo activated to assess the effects in sensitivity and color change, for it used the split mouth type methodology, which took in a bleaching gel hemi-arch and the other hemi-arch placebo. Concluding that the presence of dental sensitivity and color change were dependent on the application of whitening gel the base of hydrogen peroxide to 35% without photo activation rejecting it, the null hypothesis. Based on work by Souza, *et al.* (2010), clinically evaluate the efficacy of dental bleaching with carbamide peroxide at 16% using the technique home with and without relief in the tray, and analyze the dentine hypersensitivity. To carry out this clinical study, the experimental form of split-mouth was used, eleven patients were selected who had central incisors (11:21) top healthy. Bleaching was carried out for two weeks, and requested the use for 6 hours daily at night. It can be concluded that: The homemade technique was effective regardless of the presence of the relief in the tray. Hypersensitivity has been observed due to the combination of whitening gel. Since Silva *et al.* (2011) The objective is to clinically evaluate the bleaching effect of hydrogen peroxide concentrations of 20%, 30% and 38%, and sensitivity afforded by the gel. color change analysis and dental sensitivity, held previously and immediately after the whitening treatment and after 7, 14 and 30 days. Used (central incisors and canines) and the half-arcade design, was divided into three groups: For the three study groups was observed an increase in the bleaching effect between assessments immediately and 7 days after the end of the bleaching treatment, observing a stabilization of dental color obtained for 7.14 to 30 days. In the three groups the sensitivity was lower after 24 hours. Bortolatto *et al.* (2011) studied the dental sensitivity tested three different products and their analysis. We evaluated 40 patients which were divided into two groups, one was subjected to laser and the other group without the laser evaluated the susceptibility testing using reflectance spectroscopy. Studies have shown that the use of 15% H₂O₂ TiO₂ containing nanoparticles, obtained best results for patient and practitioner. In the same thought, Paula *et al.* 2012, presents a case report which elaborated a means of evaluating color changes of dental structure by two methods: visual (using

scale Vita Classic) and instrumental (using Easyshade spectrophotometer). The patient and the next choice made, whitening the upper and lower and color registration was assessed before and after the patient underwent three sessions of whitening and was established the middle third of the teeth for color evaluation. It was found that the two methods are feasible for a good aesthetic treatment and quickly got the realization of its benefits to the patient satisfaction.

Cerqueira *et al.* (2012), clinically evaluated the effect of a desensitizing agent previously used the application of a hydrogen peroxide gel on the effectiveness of whitening and tooth sensitivity. We selected 30 patients with good health, free of decay and restorations were divided into two groups (experimental and placebo). desensitizing was applied on the buccal surfaces of the teeth and the analysis for color evaluation was the middle third, for a period of 48 hours. Studies have shown that the use of desensitizing prior to bleaching did not affect the effectiveness and intensity of tooth sensitivity. Thus, Machado *et al.* (2013), clinically evaluate the color change and tooth sensitivity, as well as the morphology and enamel surface roughness, the technique used was: Technique 1 (whitening gel Hydrogen peroxide based on 38% associated the whitening gel B to carbamide peroxide-based 10% (placebo) split mouth or hemi-arch. the association of home bleaching with the office took effect in change of similar color just the home whitening and higher rates of tooth sensitivity associated techniques have not changed in morphology and enamel surface roughness. Following this line, painted *et al.* 2013 comparatively evaluated in vitro, the effect of desensitizing agents remineralizadores conjunction with bleaching agents, carbamide peroxide, and 16% hydrogen peroxide at 35%. They were evaluated Surface Roughness and Micro hardness divided into 160 enamel samples in 16 groups, analyzed by scanning electron microscope. Surface roughness and hardness of enamel and dentin are not affected with desmineralizing. The hardness of the enamel and dentin is changed using Desensibilize Nano P® or toothpaste Sensodyne after bleaching with carbamide peroxide at 16%. Still, Rao *et al.* (2014) has the means to evaluate the effectiveness of bleaching gels ex vivo, on the influence of dyes with and without sugar. They were evaluated healthy teeth Bank human teeth in color A2, following the Vita Easyshade spectrophotometer. We divided into dyes and teeth groups, and the agent (carbamide peroxide 16%) used for three weeks in the elements. It was concluded that the dyes in different ways just not interfering with the end result of bleaching agents. So Penha *et al.* (2015) has by checking two dental whitening products, its effectiveness as a whitener and sensitivity they studied. We selected 12 volunteers and used technique is the hemi-arch, or split-mouth, all teeth free of decay and restorations and evaluated by Vitapan Classical scale. It was concluded that between whitening gels there is no whitening difference and different tooth sensitivity.

Technical Bleaching: Marson *et al.* (2006) compared the characteristics of both bleaching techniques, home and office, its advantages and limitations. The office of used technique corresponds to a faster treatment and reduced longevity by color stability limitation, as the slowest home and a result of greater longevity, but you can use them in mixed form. Concluding that both have good and satisfactory results, we just need to identify the needs of the patient and how to adapt it regarding the procedure to be proposed. Already Riehl *et al.* 2007, has to review a bit more about the role of light sources

used in tooth whitening techniques. The method used for the study was the selection of some patients where the hemi-arch or mouth split was the methodology used to make the tests with and without light source, with the peroxide agent hydrogen and concentrations. It was concluded that today has not yet proven its effectiveness, thus making for today's dentists to a more elaborate way to sell your product easier and add value in the treatment. Nunes *et al.* (2009), came to assess in vivo effectiveness of the use of light to the peroxide gel hydrogen 37.5% used in offices. Were evaluated thirteen patients free restorations which underwent hemi-arch dividing the upper and submitted to the buccal surface of the teeth, which was considered the color difference by software. It was found that after software analysis was not different color changes, thus leaving the null hypothesis that the light sources are effective for the final result. Furthermore, Araújo *et al.* (2015) addresses dental whitening techniques and their administered bleaching agents, the agents selected in this study are hydrogen peroxide, carbamide peroxide and sodium perborate. These act through oxidation of organic compounds in both techniques when in contact with the structure releases its free radicals oxidize pigments and changing its optical form. We conclude that the techniques and applied well agents are effective provided that is accompanied by a professional.

DISCUSSION

Nowadays it has created a new smile pattern, the search for white teeth has been every day sought by greater acceptance as a standard of beauty. With all the information nowadays these bleaching techniques were more efficient when supervised by a trained professional (Luque-Martinez *et al.*, 2016). Portolani *et al.* 2005 (2005) performed a literature review that aims to assess the loss of structure through the office whitening technique and their respective concentrations. It is understood that the loss of the framework is only harmful to several repetitions of the office bleaching. Since Andrade *et al.* 2005 made studies on the loss of mineral structure by materials used for dental bleaching, and found that the loss of the structure is similar in all products, is slightly more relevant in products having more acidic pH, in both bleaching techniques. Still on the same reports Machado *et al.* (2010) and Pintado *et al.* (2013) associated the techniques of home tooth whitening and office assessing the loss of structure and tooth sensitivity where it was reported that both techniques when well executed and with the help of a professional has the same demineralization rate and the structure not changed dental morphology. However, Rao *et al.* (2014) conducted a study analyzing the bleaching technique office associating dyes and sugar to evaluate interference in treatment, and came to the result that there was no interference in its effectiveness. Thus, Marson *et al.* (2006), compares whitening techniques and their respective indications, the results were that the two techniques work well, it is more the question of the need and the patient's time that will tell us what the best way to be conducted. Souza *et al.* (2010) studied the home whitening trays and techniques with and confirms that the result is excellent and like to practice technique, thus making the two very similar techniques in their results and objectives when well executed. In another line of thought, Silva *et al.* (2011) came to compare the color variation that the structure takes over office bleaching treatment at some concentrations and sensitivity, finding a good result in practice technique, and little difference between them. Following the same thought Paula *et al.* (2012) studied the color change that the dental structure passes throughout the

treatment and noted that both techniques are viable for a good cosmetic treatment. Knowing about techniques and methods, Araújo (2015) analyzed both the office technique as home, having noticed that the two when well executed and assisted by a professional will produce the very next effect and will depend on adaptation of the patient with what technique he will fit better, thus making satisfactory treatment for both the patient and the professional. Studies Riehl *et al.* (2007) and Nunes *et al.* (2009) evaluated the association of light sources to practice technique and their respective concentrations and found effectiveness or ineffectiveness, needing still have more studies to prove. Thus the work of Machado *et al.* 2010, Clarifying technical office not associated with light, it works very well when compared to others. Bortolatto in 2011 analyzed the dental sensitivity by the types of bleaching techniques with and without light, in order to know better results and their hypothesis cannot be proven because the two techniques made no difference the use of light. Thus looking for an improvement in the dental sensitivity, Christopher *et al.* 2012. evaluated the use of desensitizing treatment during the bleaching techniques both becoming the null hypothesis that improve the sensitivity during treatment. Another author who studies the sensitivity is Penha *et al.* 2015, which they sought to study the difference gels in a bleaching treatment both in home technique as in the office technique and found almost zero their differences, after studies was perceived by the authors that the professional must be trained and informed about techniques and products to be used by it in order for a good cosmetic treatment.

Conclusion

Both techniques are excellent when well conducted by professional and well educated to the patient, thus enabling treatment satisfaction for the patient and the professional. The sensitivity in the bleaching treatment is patient variable to the patient being indicated fluorine application after bleaching to decrease the sensation, but nothing during bleaching controls this effect.

Competing interests: The authors declare que they have no competing interests.

REFERENCES

- Andrade AP. 2005. Efeito da técnica de clareamento no conteúdo mineral do esmalte dental humano (Dissertação de Mestrado). São Paulo: Faculdade de Odontologia da USP; 2005.
- Araújo JLS, Reis BS, Gonçalves NM, Brum SC. 2015. Técnicas de clareamento dental Revisão de literatura. Revista Pró- Univer SUS. Jul./Dez., 06 (3): 35-37.
- Bortolatto, J.F. 2011. Sensibilidade dolorosa e efetividade determinadas por clareamento dental de consultório / Janaina Freitas Bortolatto. – Araraquara: (s.n.), 95 f. ; 30 cm.
- Cerqueira RR., Hofstaetter FL. Kossatz S. Doutorado - Professora Associada da Disciplina de Dentística Restauradora – UEPG. Efeito do uso de agente dessensibilizante e na efetividade do clareamento e na sensibilidade dental; Av. Carlos Cavalcanti, 4748 - Bloco M - Sala 64-A Uvaranas - Ponta Grossa – PR 84030-900.
- Luque-Martinez I, Reis A, Schroeder M, Muñoz MA, Loguercio AD, Masterson D, Maia LC. 2016. Comparison of efficacy of tray-delivered carbamide and

- hydrogen peroxide for at-home bleaching: a systematic review and meta-analysis. *Clin Oral Investig.*, 20 (7):1419-33.
- Machado, Lucas Silveira., Prof. Renato Herman Sundfeld, Prof. Eduardo Passos Rocha Observação clínica da aplicação de um produto a base de peróxido de hidrogênio a 35 % não fotoativado : efeitos na sensibilidade e na alteração de cor / Lucas Silveira Machado. -- Araçatuba : (s.n.), 2010 68 f. : il. ; tab. + 1 CD-ROM Dissertação (Mestrado) – Universidade Estadual Paulista, Faculdade de Odontologia, Araçatuba, 2010
- Marson, F. C., Sensi, L. G., Araújo, F de O. Andrada, M. A. C. de; Araújo, É. 2006. Na era do clareamento dentário a laser ainda existe espaço para o clareamento caseiro? *R Dental Press Estét* - v. 3, n. 1, p. 89-98, jan./fev./mar.
- Nunes, F.M., Masotti, S.A., Rolla, N.J., Soares, G.C, Conceição, E.N. 2009. Avaliação Clínica do Efeito de Duas Técnicas de Clareamento Dental em Consultório Utilizando Peróxido de Hidrogênio; *Rev. Fac. Odontol. Porto Alegre*, v. 50, n. 2, p. 8-11, mai./ago.
- Paula EA, Farhat PBA, Jorge JH, Gomes JC. 2012. Análise Espectrofotométrica e Visual do Clareamento Dental: Relato de Caso Clínico; Universidade Estadual de Ponta Grossa, Paraná, Brasil; *UNOPAR Cient Ciênc Biol Saúde.*, 14(1):45-50
- Penha, S.E., Pinto, T.W., Santos, L.R., Guênes, T.M.G., Medeiros, M.D.A.L., Lima, A.M.A. 2015. Avaliação de diferentes sistemas de clareamento dental de consultório, *RFO, Passo Fundo*, v. 20, n. 3, p. 281-286, set./dez. 281.
- Pintado-Palomino, Karen. Avaliação de agentes remineralizadores e dessensibilizantes no tratamento de clareamento dental: estudo in vitro. Ribeirão Preto, 2013. 79 p.: il 30cm Dissertação de Mestrado, apresentada à Faculdade de Odontologia de Ribeirão Preto/USP. Área de Concentração: *Reabilitação Oral*. Orientadora: Profa. Dra. Camila Tirapelli
- Portolani Junior MV, Candido MSM. 2005. Effects of dental bleaching on dental structures. *Rev Odontol UNESP*. 34(2): 91-4.
- Renato Herman Sundfeld, Machado, Lucas Silveira. 2013. Avaliação clínica dos efeitos da associação do peróxido de hidrogênio a 38 % com o peróxido de carbamida a 10 % / Lucas Silveira Machado. - Araçatuba: 77 f. : il. ; graf. + 1 CD-ROM Tese (Doutorado) – Universidade Estadual Paulista, Faculdade de Odontologia de Araçatuba
- Rezende M; Cerqueira RR., Loguercio AD, Reis A., Kossatz S. 2014. Corantes com e sem açúcar versus efetividade do clareamento dental: estudo ex vivo; Universidade Estadual de Ponta Grossa, Rua Carlos Cavalcanti, 4748, Bloco M, Sala 64A – Uvaranas, Ponta Grossa, Paraná, *Brasil; Rev Odontol Bras Central.*, 23(66)
- Riehl, H., Nunes, MF. 2007. As fontes de energia luminosa são necessárias na terapia de clareamento dental? eBooklido 25º Congresso Internacional de Odontologia de São Paulo – 25º CIOSP. Cap. 7. site www.ciosp.com.br – APCD.
- Schroeder M, Reis A, Luque-Martinez I, Loguercio AD, Masterson D, Maia LC. 2015. Effect of enamel bevel on retention of cervical composite resin restorations: a systematic review and meta-analysis. *J Dent.*, 43:777–788.
- Silva BR. 2011. Avaliação clínica de peróxidos de hidrogênio em diferentes concentrações: alteração de cor e sensibilidade. Dissertação apresentada à Faculdade de Odontologia da Universidade de São Paulo para obtenção do título de Mestre em Odontologia.
- Souza CHF 2010. professor da Faculdade de Odontologia da Universidade Federal do Rio Grande do Sul. Fábio Herrmann Coelho-de-Souza. Rua Ramiro Barcelos, 2492 – Bairro Santana – CEP 90035-003 – Porto Alegre /RS *Stomatos Canoas* v.16 n.30 p.33-39 jan./jun. 2010.
