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Research Paper

Comparative Clinical Study on Professional Bleaching According to Two Age Groups

Medical Science

KEYWORDS : professional bleaching, hydrogen peroxide, teeth

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ABSTRACT

Bleaching has become an important part of aesthetic dentistry, representing the most conservative method of treatment of dental discoloration.The purpose of this study was to evaluate the effectiveness of bleahing with Opalescence Boost 40%, according to the age under 30 years compared to those over 30 years.Was used the professional teeth bleaching kit, Opalescence Boost 40% (Ultradent® Products, Inc., S. South Jordan, UT) on the basis of 40% hydrogen peroxide. Evaluation of tooth shade was performed at baseline and immediately after treatment. Visual analysis method was used to color with the key of classic colors, Vitapan (Vita Zahnfabrik, Germany).At the statistical analysis we used the scores corresponding to each tone determined.The results show that the entire batch bleaching efficacy was assessed by analyzing the mean values and standard deviations, the wedding scores before and after treatment. The analysis was performed on a total of 320 teeth. It was a mean of 4.55 ± 2.17 effectiveness of color shades, p <0.05. In conclusion within this study, the whitening system used was effective and gave visible results in all patients included in the study but there is no significant difference in the color change in patients aged under 30 years compared to those over 30 years and also between the upper and lower maxillary arches.

Introduction

Bleaching has become an important part of aesthetic dentistry, representing the most conservative method of treatment of dental discoloration. Special interest enjoyed this type of dental treatment, especially among patients and physicians, have led to numerous market profile for bleaching products and application techniques.

Numerous studies have demonstrated the effectiveness of whitening with hydrogen peroxide and carbamide peroxide. (Giachetti, Bertini, Bambi, Nieri and Russo(2010),Bizhanget al (2009), PolydorouHellwig and Hahn (2008).

The controversies in the literature concerning photo catalysts and thermics catalysts and high costs involving these treatments, leads many experts to be reluctant face the use of this products (Hein et al (2003), Eldeniz, Usumez AUsumez S and Ozturk (2005) Carrasco, Carrasco-Guerisoliand Fröner (2008)).

Goldstein asserts (Goldstein and Garber, 1995) that the effectiveness of whitening treatments is subject to several factors: a clean surface of the tooth, hydrogen peroxide concentration, temperature, pH, length of time (Lee, Kwon and Park , 2008). Numerous studies assess the influence of various factors on bleaching such as time and frequency applications, the concentration of bleaching agent, tooth structure, photo catalysts and thermics catalysts, the use of ozone or sealing of bleaching agent. However there are few studies that have aimed to evaluate the importance of patient age on outcome.

The purpose of this study was to evaluate the effectiveness of whitening with Opalescence Boost 40%, according to the age. Null hypothesis is that there is a significant difference in the color change in patients aged under 30 years compared to those over 30 years.

The objectives of this trial were to assess:

- • whitening efficacy;
- • the degree of color change;
- • the dental sensitivity;
- • to compare the degree of color change in patients aged under 30 and over 30 years;

Materials and methods

For this study were selected 16 patients, aged 19-40 years.

Inclusion criteria were:

- integrityof the teeth;
- age over 18 years;
- good general health;
- to agree to sign the informed consent form to treatment;
- to agree to return for scheduled visits and review.

Exclusion criteria were:

- gingivitis or periodontitis;
- allergic reactions to peroxides;
- use of bleaching agents in the past year;
- tooth sensitivity;
- woman pregnant or breastfeeding;

Was used the professional teeth bleaching kit, Opalescence Boost 40% (Ultradent® Products, Inc., S. South Jordan, UT) on the basis of 40% hydrogen peroxide. The kit contains concentrated peroxide gel and 40% chemical activator, 1.1% fluorine, 3% of potassium nitrate, gingival barrier (OpalDam Green). For light curing gingival barrier to use a lamp with halogen 3M.Photos were recorded with the camera Panasonic Lumix DMC-TZ10 (12.1 megapixel resolution, wide-angle 25mm lens, 12x optical zoom). Patient data were recorded in the statement of chemical treatment of tooth discoloration.

Evaluation of tooth shade was performed at baseline and immediately after treatment. Visual analysis method was used to color with the key of classic colors, Vitapan (Vita Zahnfabrik, Germany). The 16 samples were ordered by brightness (Table 1). The color was performed by two evaluators, under natural light. All evaluations were performed by the same evaluators and under the same conditions. At the statistical analysis we used the scores corresponding to each tone determined.

Table 1 - Key VITAPAN colors with samples organized by brightness

Nuance	Score
B1	1
A1	2
B2	3
D2	4
A2	5
C1	6
C2	7
D4	8
A3	9
D3	10
B3	11

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A3,5	12
B4	13
C3	14
A4	15
C4	16

Tooth Sensitivity was assessed before bleaching (baseline) and immediately after bleaching according to a questionnaire VAS (Visual Analogue Scale). Scale sensitivity values is:

- 0-1: Sensitivity Score 1 = absent
- 2-3: Sensitivity Score 2 = slight
- 4-6: Sensitivity Score 3 = moderate
- 7-8: Sensitivity Score severe = 4
- 9-10: Sensitivity Score unbearable = 5

To reduce tooth sensitivity during and / or after whitening procedure was used the desensitization product UltraEZTM (Ultradent® Products Inc., S. South Jordan, UT). This product contains 3% potassium nitrate and sodium fluoride 0.25%.

Study design

The subjects were divided into 2 groups (G), the criterion being their age distribution. In G1 group were seven patients aged 18-29 years were in the group G2 9 patients aged 30-49 years.

- Complete intraoral examination and professional cleaning with one week before the bleaching treatment.
- Clean surfaces with a dental abrasive cups to remove the dental plaque and stains surface. (On the day scheduled for whitening treatment).
- Register with the key tooth shade of classic colors, Vitapan (Vita Zahnfabrik, Germany).
- Applyingbilateral of the interarch support Isoblock.
- Greasing the lips and mouth corners.
- Applying of buccal retractor for adults.
- Initial photography for to document.
- Applying of the gingival barrier Green OpalDam according to the manufacturer's instructions.
- Applying of whitening gel according to the manufacturer's instructions.
- Applying the gel on the bucal face in two consecutive sessions 15 minutes each, respecting the manufacturer.
- Removal of gingival barrier. Rinsing the oral cavity.
- Evaluation of the final color VITA and documenting with photography. Establishing patient recommendations.

Statistical data were analyzed using Microsoft Office Excel 2010 (Microsoft, Redmond, WA, USA). T test (student) "paired t-test" was used to compare the mean value of the scores of dental shades before and after the bleaching treatment.

Results

The group of patients was composed of 37% men and 63% women.The entire batch bleaching efficacy was assessed by analyzing the mean values and standard deviations, the wedding scores before and after treatment. The analysis is performed on a total of 320 teeth. It was a mean of 4.55 ± 2.17 Effectiveness of color shades, p <0.05 (Fig.1).

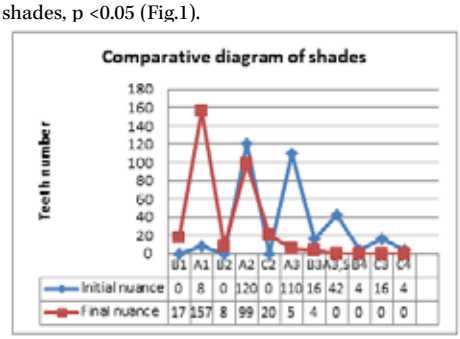

Figure 1 Comparative diagram of shades

Bleaching efficacy for G1 and G2 was calculated separately analyzing the mean values and standard deviations of scores before and after treatment. Analysis was done on 120 teeth (G1) and 200 teeth (G2). For G1 to a mean of 4.26 ± 2.02 efficacy shades of color, p <0.05. For G2 has a mean of 4.72 ± 2.25 Effectiveness of color shades, p <0.05.

Bleaching efficacy analysis between the two groups (G1 and G2) showed a value of p = 0.06, p> 0.05 which confirms the hypothesis that 0 of the study, the two groups there is a difference significant color or teeth for patients aged under 30 years, statistically, there were more than teeth bleached patients older than 30 years.

For the analysis of the color difference G1 between the two dental arches, were used and the mean values standard deviations of the scores for the effectiveness of tooth 120, tooth 60 upper arches and teeth 60 to the lower arches. The following values were obtained 3.98 ± 1.91 4.55 ± 2.10 superiority arch to the lower arch, p = 0.12.

For the analysis of the color difference G2 between the two dental arches, were used and the mean values standard deviations of the scores for the effectiveness of the teeth 200. The following values were obtained 4.85 ± 2.25 ± 2.25 and 4.6 with upper arch to the lower arch, p = 0.43.

Tooth sensitivity analysis was done by analyzing the sensitivity scores before and after treatment in 16 patients. Before treatment all patients had score 1 respectively the sensitivity was absent. After treatment 56% of patients had mild dental sensitivity, 25% moderate dental sensitivity and the remaining 19% no dental sensitivity.

Discussions

The study aimedif whether patients' age can be considered a tooth whitening efficacy parameter, allowing the clinician to be more predictable in terms of results. (Gosselin, Smith and Hodge (1984)).

The results are different from other studies. Lin et al. (2008) concluded that the teeth of young patients aged under 30 years were more than teeth bleached patients aged over 30 years. This can be explained by the fact that the two studies used concentrations manufacturers and different techniques. In the study by Lin et al. hydrogen peroxide was used 35% LaserSmile, Twila LaserSmile laser diode, the material was applied only once, and measurements were made using ShadeEye NCC colorimeter.

Most studies have shown that there is not a greater difference in color for laser bleaching. In terms of color analysis method, it is true that the method of visual analysis with the key Vitapan is a subjective procedure, influenced both by external factors and the skills of conducting the examination. For this purpose for reduction the error, the color of the teeth was determined by two examiners, and the key 16 of the color samples are arranged on brightness.

The differences in the brightness are more easily detected than the differences in color saturation or hue caused by the mismatch. (Paravina, Powers,(2004)) ShadeEye NCC colorimeter used in the study of Lin et al. is advantageous in that it eliminates bias and quantify the color parameters by numerical values, with the ability to store and transmit information obtained. Also the initial shade of the teeth is also important, bleaching efficacy was higher in patients with nuanced compared with C or D. (Gosselin, Smith and Hodge (1984))

As in our study and the study of Lin et al. (Lin et al (2008)), de-

termining the color was initially made directly after the treatment. The accuracy of determining the color immediately after bleaching treatments is another controversy in the literature. Whitening effect immediately after treatment is due to dehydration dental whitening treatment induced. Although dehydration caused by dental bleaching agents has not been fully explored, there are authors (Gosselin, Smith and Hodge (1984)) who argue that whitening products as a vehicle using hydrogen peroxide, glycerin, which absorbs water and induce dehydration whitening product.

The study by Betke et al. (2006) showed that whitening products used by them, had a content of 86% glycerol causing teh dehydration of the bovines teeth used in the study. The lasers type is an additional factor of dehydration (Luk, Tam aand Hubert (2004)). It is therefore recommended that the bleaching should be valued at one week post treatment greater accuracy of the data. On the other hand as the period of tooth color revaluation increase the amount of time the chance for patients to consume foods chromogenic increases, influencing the data. Therefore, in our study we opted for color evaluation immediately after treatment.

The whitening for the entire study group had a mean of 4.55 ± 2.17 light shades. Data were statistically significant. As indicated ADA after whitening treatments, we must have a reduction of two brightness scale scores for four units.

With regard to tooth sensitivity, this study confirmed data in the literature that the bleaching is a technique that causes sensitivity. After treatment 56% of patients had mild dental Sensitivity, 25% moderate tooth sensitivity and the remaining 19% no dental sensitivity.

Other comparative studies of different concentrations of hydrogen peroxide used in bleaching concluded that between 10% PC. and 15% PC. no statistically significant difference on the results. (Matis, Mousa, Cochran and Eckert (2000), Krause, Jepsen, and Braun (2008), Meireles et al (2008))

Color stability obtained after bleaching, is also widely debated in the literature, studies concluded that no light source influences the stability of treatment [18], and that 14 days of treatment at home by 10% PC, is more effective than whitening with a higher pH. (Abbot (1918))

A valid comparison of data obtained by researchers, is difficult due to the lack of a systematic methodology in this regard.

The real challenge for physicians is the determination of the most effective whitening methods while maintaining a high degree of safety for the patient.

CONCLUSION

Within this study, it can be concluded that:whitening system used was effective and gave visible results in all patients included in the study but there is no significant difference in the color change in patients aged under 30 years compared to those over 30 years and also between the upper and lower maxillary arches.

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