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ANALYSIS ON THE NUMBER OF VISITS, TYPE OF AGENT USED, PRE OPERATIVE SHADE ON THE COLOUR CHANGE IN UPPER ANTERIORS UNDERGOING NON VITAL BLEACHING- RETROSPECTIVE ANALYSIS ON OUTCOME RELATED DATA

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Abstract

Introduction: Discoloured anterior teeth is always a reason for the development of an inferiority complex when esthetics is considered as a single discoloured tooth stands out from the rest, drawing more attention towards it. Hence, bleaching has become one of the most desired treatments in dentistry. However, there seems to be a lack in studies which focus on factors like number of visits, preoperative shade in determining the rate of success of bleaching procedures. The aim of this study is to analyse how the number of visits, type of agents used and the preoperative shade determines colour change in upper anteriors undergoing non vital bleaching.

Materials and methods: This retrospective study was done by surveying the data of patients who underwent non vital bleaching in a university dental hospital. Data like age, gender, preoperative shade, number of visits, type of agents used during non vital bleaching were collected. The collected data was then tabularised and imported to SPSS Version 23 for statistical analysis. Chi Square test was used to find any association between comparative variables.

Results: Males were the most common gender to undergo non vital bleaching, sodium perborate was the most commonly used bleaching agent and older patients needed more visits to achieve a satisfactory result ($p<0.05$). The most common pre-operative shade was A4.

Conclusion: Males were the most common gender to undergo non vital bleaching. The most common age group to undergo non vital bleaching is 15-22 year olds. There is no correlation between age, gender and number of visits with postoperative colour change.

Keywords: bleaching, agent, non-vital, visits.

Introduction

The colour of natural teeth is affected by several parameters. It depends on the thickness, composition and structure of the tissues forming the tooth. These three parameters will evolve considerably through life, thereby influencing tooth colour. Any pathological or traumatic incidents can cause an everlasting impact on these dental structures. Tissue necrosis due to any cause can lead to release of disintegration by-products that may penetrate tubules and discolour the surrounding dentin. The degree of discolouration is directly related to how long the pulp has been necrotic. The longer the discolouration products are present in the pulp chamber, the greater the discolouration[1]. There has always been an innate desire in us to get our teeth as white as possible. As we proceed in the future, this urge is constantly getting stronger as our society is getting more esthetic conscious[2]. Improvement in the patients smile aesthetically provides a boost in the morale of a patient and restores their self confidence. One of the ways to improve the natural colour of the tooth is by a procedure called bleaching which was defined as "the lightening of the colour of a tooth through the application of a chemical agent to oxidize the organic pigmentation in the tooth is referred to as bleaching"[3].

There are various agents used for bleaching, the most common of them are hydrogen peroxide and sodium perborate either used separately or in a combination. A combination of SP and water or H2O2 has been used in the "walking bleach" technique[4]. These agents are used in high concentrations for non-vital teeth and act as oxidizing organic pigments via the decomposition products of the chemical agent[3,5].

There are multitudes of studies which compare the rate of success of non vital bleaching and the preoperative shade and the type of agents used but very few studies consider the number of visits as a factor which determines the rate of success of non vital bleaching. Hence, the aim of this study is to analyse how the number of visits, type of agents used and the preoperative shade determines colour change in upper anteriors undergoing non vital bleaching.

Materials and methods

Study design:

The study design was a retrospective study

Study population:

The present study focussed on the patients who underwent non vital bleaching in a university dental college. The sample size of the study was 79 participants.

Sampling methodology:

Convenience sampling methodology was used.

Data collection:

The data was taken by analysing the case sheets of patients who underwent non vital bleaching. Data taken were age, gender, pre operative shade, the number of visits and the type of agent used for bleaching. Ethical clearance was obtained from the Scientific Review Board of the college. The data collected was reviewed by an administrator. Incomplete data were excluded from the study.

Statistical Analysis

The data collected was tabulated in Microsoft Excel and was later transported to IBM SPSS Version 23 for statistical analysis. Descriptive statistics were expressed by means of frequency and percentage. Chi- Square test was used to find the association between variables. The level of statistical significance is at $p<0.05$.

Results

79 case sheets were included in the study. The details which were considered were age, gender, pre operative shade, number of visits and the type of agents used for non vital bleaching. Out of the 79 patients, 55 were male patients and 24 were female patients. 13 patients were between the ages of 15-21 years, 41 patients were between the ages of 22-28 years, 16 patients were between the ages of 29-35 years, 5 patients were between the ages of 36-42 years and 4 patients were between the ages of 43-49 years. The most common preoperative shade was A4(25.3%) followed by A3(12.6%). Males, in a majority, preferred sodium perborate and a mixture of sodium perborate and 10% H2O2. No female patients preferred a mixture of sodium perborate and saline and a mixture of sodium perborate, saline and 10% H2O2. Both males and females equally preferred 10% H2O2 and a mixture of sodium perborate and superoxol.

10% H2O2 was used by patients in the age group of 15-21 years and 22-28 years equally. Sodium perborate was used in a majority by 22-28 year old patients, followed by 15-21 year olds. A mixture of sodium perborate and 10% H2O2 was used in a majority by 22-28 year olds followed by 29-35 year olds. A mixture of sodium perborate and saline was used in a majority by 22-28 year olds. The only group which used a mixture of sodium perborate, saline and 10% H2O2 was 22-28 year olds. A mixture of sodium perborate and superoxol was used equally by 15-21 year olds and 29-35 year olds. Males were the majority group who came for 3 visits. The age group of 22-28 year olds were the most frequent to come for a third visit for non vital bleaching. This was followed by 29-35 year olds.

Discussion

Our team has extensive knowledge and research experience that has translate into high quality publications[6–25].

The present study focuses on colour change affected by number of visits, pre operative shade and type of agent used for non vital bleaching. The most common age group to undergo non vital bleaching was 22-28 years(51.8%). This was similar to a study done by Noorul et al where the most common age group to undergo non vital bleaching was 19-22 years[26]. The most common gender to undergo non vital bleaching was males(69.6%). This is similar to a study done by Choudhari et al in a similar geographic area where the most common gender which underwent non vital bleaching was males[27].

The present study shows only 34% of the participants who came back for a third visit. This was mainly due to irritation due to the requirement of multiple appointments to achieve satisfactory results. This is similar to a study done by Gupta et al in which 4% of the patients cancelled further appointments due to dissatisfaction because of requirements of multiple appointments[2]. The present study also shows that older patients required more appointments

when compared to younger patients to achieve a satisfactory result, which is also seen in the study by Gupta et al[2]. However, the opposite was seen in a study done by Coelho et al where the number of appointments did not influence the results[28].

The present study showed sodium perborate to be the most common bleaching agent used. This is contradictory to the results of a study done by Bhatnagar et al where carbamide peroxide was the most common bleaching agent[29]

In 1996, one manufacturer (Ultradent Products, South Jordan, UT, USA) suggested the use of 10% carbamide peroxide applied in a tray for a tooth prepared for the traditional walking bleach technique. This technique is called inside-outside bleaching as the bleaching takes place simultaneously within and outside the tooth. Several authors have reported that this technique can be successfully used for bleaching non vital teeth[30]

The limitations of the current study are that the population of the study is limited to a specific geographic area, the sample size was relatively small and review was taken only for a year. Future scope includes taking a larger population into account and populations from different geographical locations.

Conclusion

Males were the most common gender to undergo non vital bleaching. The most common age group to undergo non vital bleaching is 15-22 year olds. There is no correlation between age, gender and number of visits with postoperative colour change.

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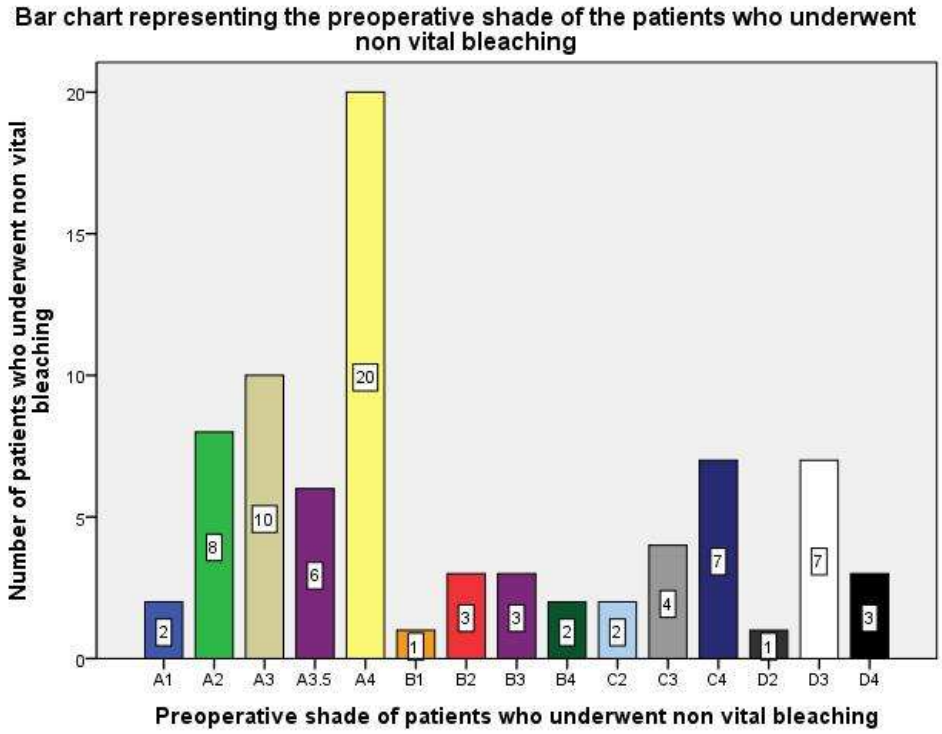

Figure 1: Bar graph representing the pre operative shade of the patients who underwent non vital bleaching. The X axis denotes the preoperative shade of patients who underwent non vital bleaching and the Y axis denotes the number of patients who underwent non vital bleaching. Blue denotes patients who had a preoperative shade of A1, green denotes patients who had a preoperative shade of A2, beige denotes patients who had a preoperative shade of A3, violet denotes patients who had a preoperative shade of A3.5, yellow denotes patients who had a preoperative shade of A4, orange denotes patients who had a preoperative shade of B1, red denotes patients who had a preoperative shade of B2, purple denotes patients who had a preoperative shade of B3, dark green denotes patients who had a preoperative shade of B4, light blue denotes patients who had a preoperative shade of C2, light grey denotes patients who had a preoperative shade of C3, dark blue denotes patients who had a preoperative shade of C4, dark grey denotes patients who had a preoperative shade of D2, white denotes patients who had a preoperative shade of D3 and black denotes patients who had a preoperative shade of D4.

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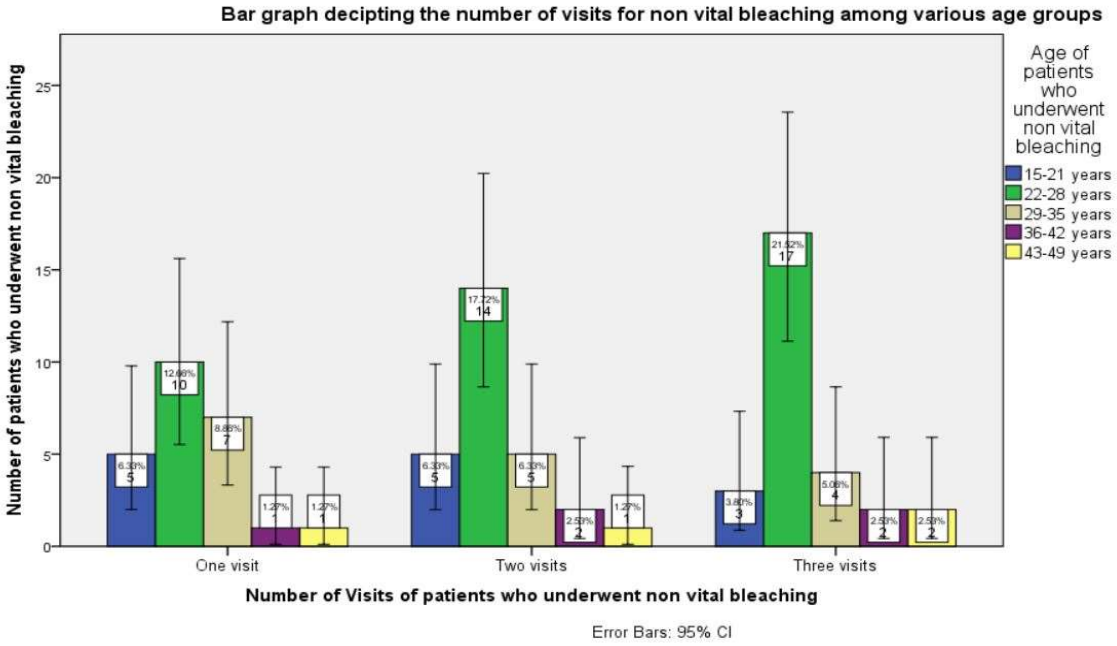

Figure 2: Bar graph depicting the number of visits for non vital bleaching among various age groups. The X axis represents the number of visits of patients who underwent non vital bleaching and the Y axis represents the number of patients who underwent non vital bleaching. Blue represents patients in the age group of 15-21 years, green represents patients in the age group of 22-28 years, beige represents patients in the age group of 29-35 years, violet represents patients in the age group of 36-42 years and yellow represents patients in the age group of 43-49 years. p value was found to be 0.864 ($p>0.05$) which is not statistically significant.

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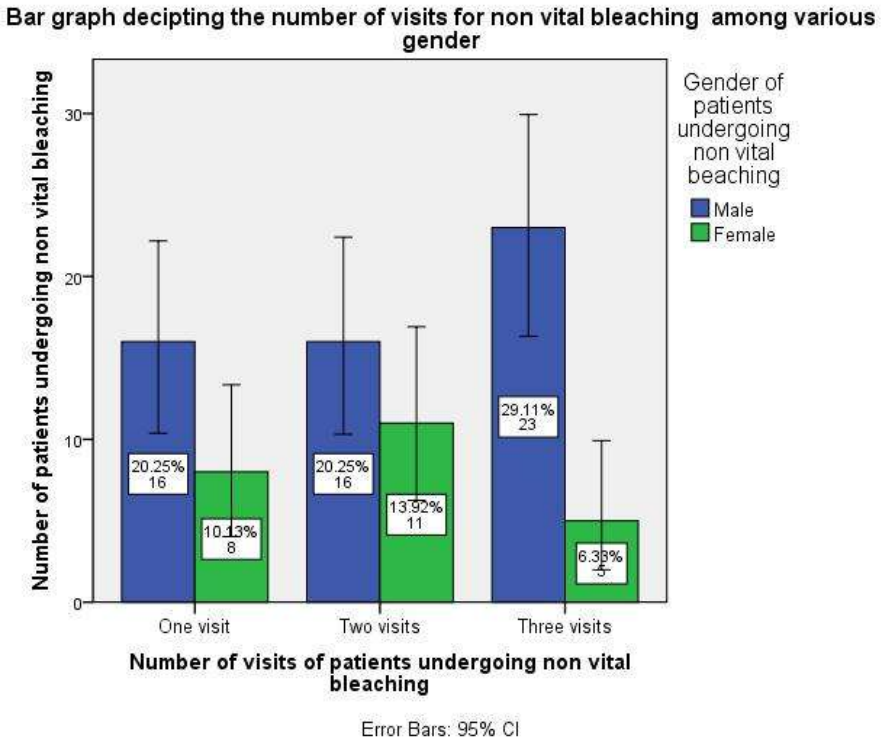

Figure 3: Bar graph depicting the number of visits for non vital bleaching among various genders. The X axis represents the number of visits of patients who underwent non vital bleaching and the Y axis represents the number of patients who underwent non vital bleaching. Blue represents male patients who underwent non vital bleaching and green represents female patients who underwent non vital bleaching. p value was found to be 0.170 ($p>0.05$) which is not statistically significant.

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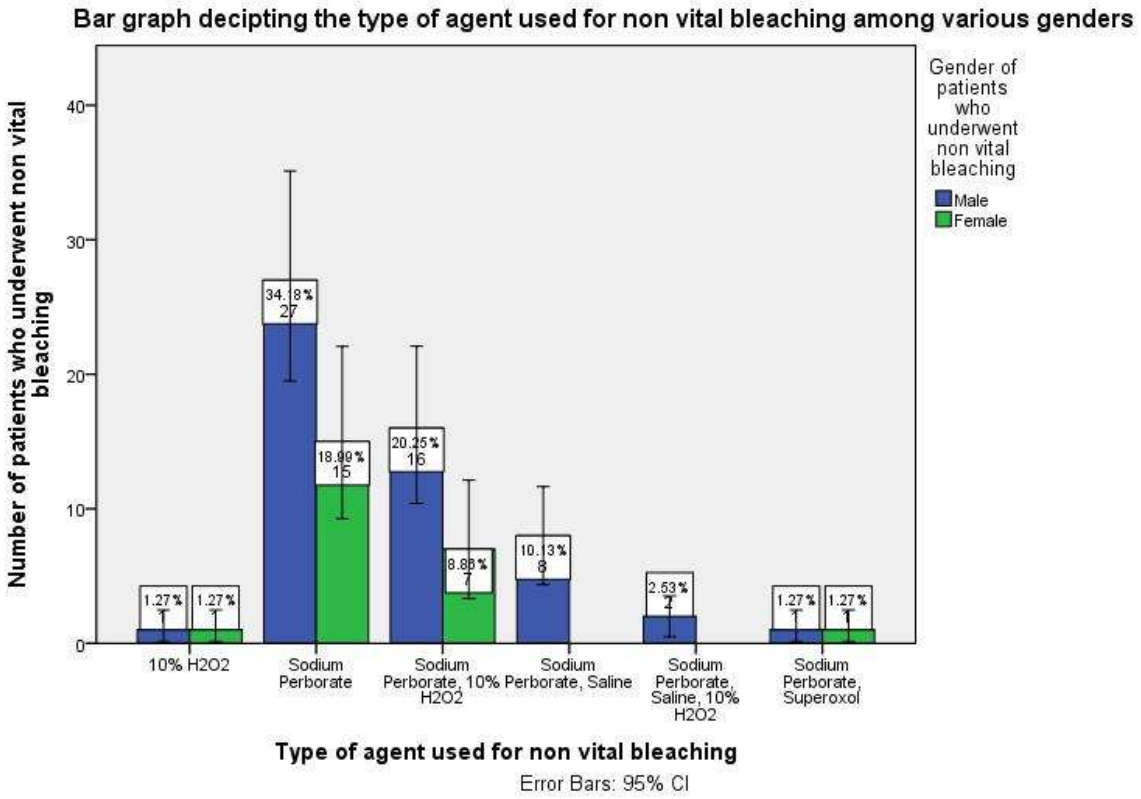

Figure 4: Bar graph depicting the number of visits for non vital bleaching among various genders. The X axis represents the type of agent used for non vital bleaching and the Y axis represents the number of patients who underwent non vital bleaching. Blue represents male patients who underwent non vital bleaching and green represents female patients who underwent non vital bleaching. p value was found to be 0.341 ($p>0.05$) which is not statistically significant.

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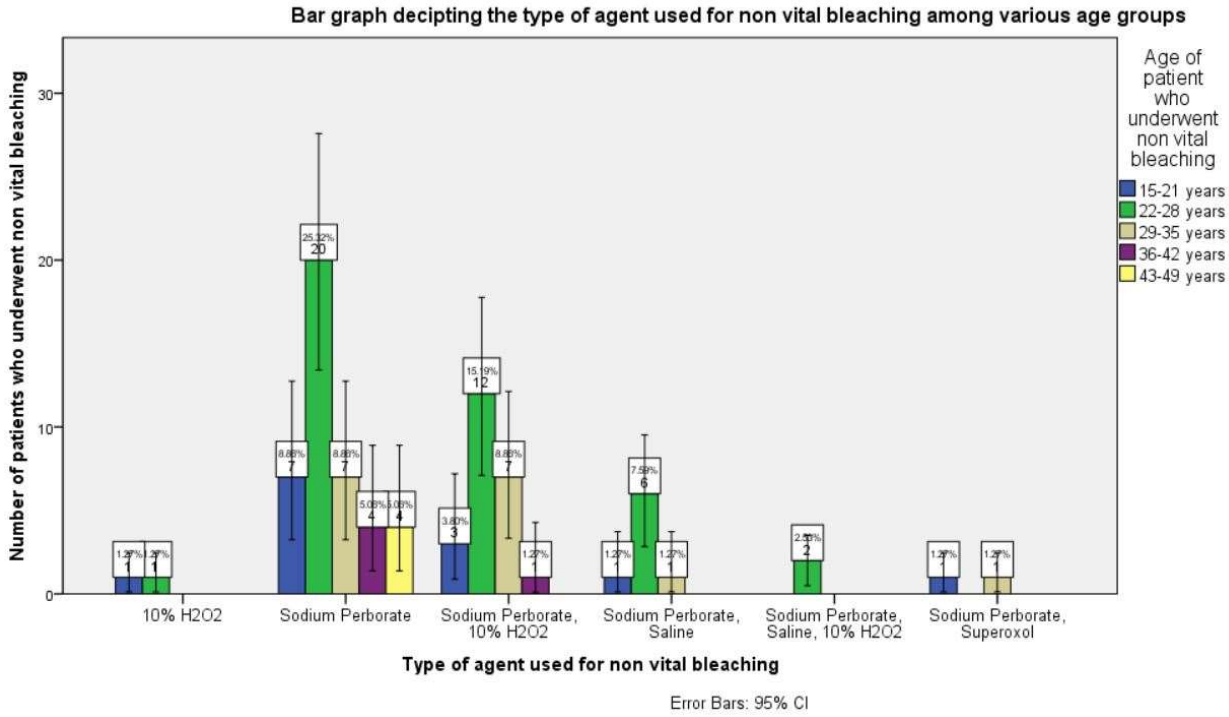

Figure 5: Bar graph depicting the type of agent used for non vital bleaching among various age groups. The X axis represents the type of agent used for non vital bleaching and the Y axis represents the number of patients who underwent non vital bleaching. Blue represents patients in the age group of 15-21 years, green represents patients in the age group of 22-28 years, beige represents patients in the age group of 29-35 years, violet represents patients in the age group of 36-42 years and yellow represents patients in the age group of 43-49 years. p value was found to be 0.788 ($p>0.05$) which is not statistically significant.