

Investigation of the influence of SeLECT Defense Sealant on Tooth Color

Principal Investigator/Institution:

Bennett T. Amaechi, BDS, MS, PhD, FADI
Associate Professor and Director of Cariology
Department of Comprehensive Dentistry, MC 7917
University of Texas Health Science Center at San Antonio
7703 Floyd Curl Drive, San Antonio, Texas 78229-3900, USA
Tel: 1 210 567 3200/3185; Fax: 1 210 567 4587
Email: amaechi@uthscsa.edu

Sponsor/ Sponsor's representative:

Kenny Gallagher
President
Element34 Technology, Inc.
Phone: 806.780.3400; Fax: 806.780.3404
Email: kenny@e34tech.com

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OBJECTIVE

The primary purpose of this study was to determine if the application of SeLECT Defense sealant or primer will affect the color of the tooth.

MATERIALS AND METHODS

Teeth Preparation: Teeth that were extracted and appropriately disposed at the various clinics of the University of Texas Health Science Center San Antonio were collected and thoroughly cleaned to remove external stains from the tooth surfaces. 20 teeth without visible white-spot lesion or other discoloration-causing anomalies were selected. The teeth were kept in a moist environment to maintain their initial hardness and color through the entire period of the experiment. Each tooth was then cut in a mesiodistal direction to produce two samples, each bearing either the lingual or buccal surface of the tooth, giving a total of 40 teeth samples and the samples were given code numbers.

Baseline color measurement: Using ShadeEye Optical Chromamometer, the color of each tooth surface was measured and recorded. ShadeEye measurement is presented as Shade (S) and Value (V). Shade records a broad color change in the tooth surface, while Value is a measurement used to describe a more minute, distinct color change. Each sample was measured three (3) times over a period of two (2) days in order to obtain an average baseline measurement.

Experimental groupings and treatment: Following the baseline treatment, the samples were randomly assigned to the following four treatment groups (10 samples/group).

Group 1: Tooth surface etched with 37% phosphoric acid for 30 seconds, SeLECT Defense (SD) sealant applied and light-cured for 20 seconds.

Group 2: SeLECT Defense (SD) sealant applied on tooth surface without etching and light-cured for 20 seconds.

Group 3: Tooth surface etched with 37% phosphoric acid for 30 seconds, Pro Seal applied and light-cured for 20 seconds.

Group 4: Pro Seal applied on tooth surface without etching and light-cured for 20 seconds.

Post-treatment color measurement: Following treatment, the samples were stored in distilled de-ionized water in an incubator at 37°C for 24 hours before post-treatment color measurement. After 24 hours, the color of each tooth surface was re-measured using ShadeEye Optical Chromamometer. As stated above, the color of

each tooth surface was measured three times over a period of two (2) days and the average values were recorded.

Statistical analysis:

The statistical analysis was conducted on both Shade and Value data with the level of significance (α) prechosen at 0.05. Intra-group comparison between baseline (non-sealed) and post-treatment (sealed) was carried out using paired t-tests. Intergroup comparison were conducted using non-paired t-tests e.g etched vs non-etched, etc. Using non-paired tests allow for the isolation of specific variables to determine which treatment type causes the shade or value change.

RESULTS

Control vs. Treatment Groups

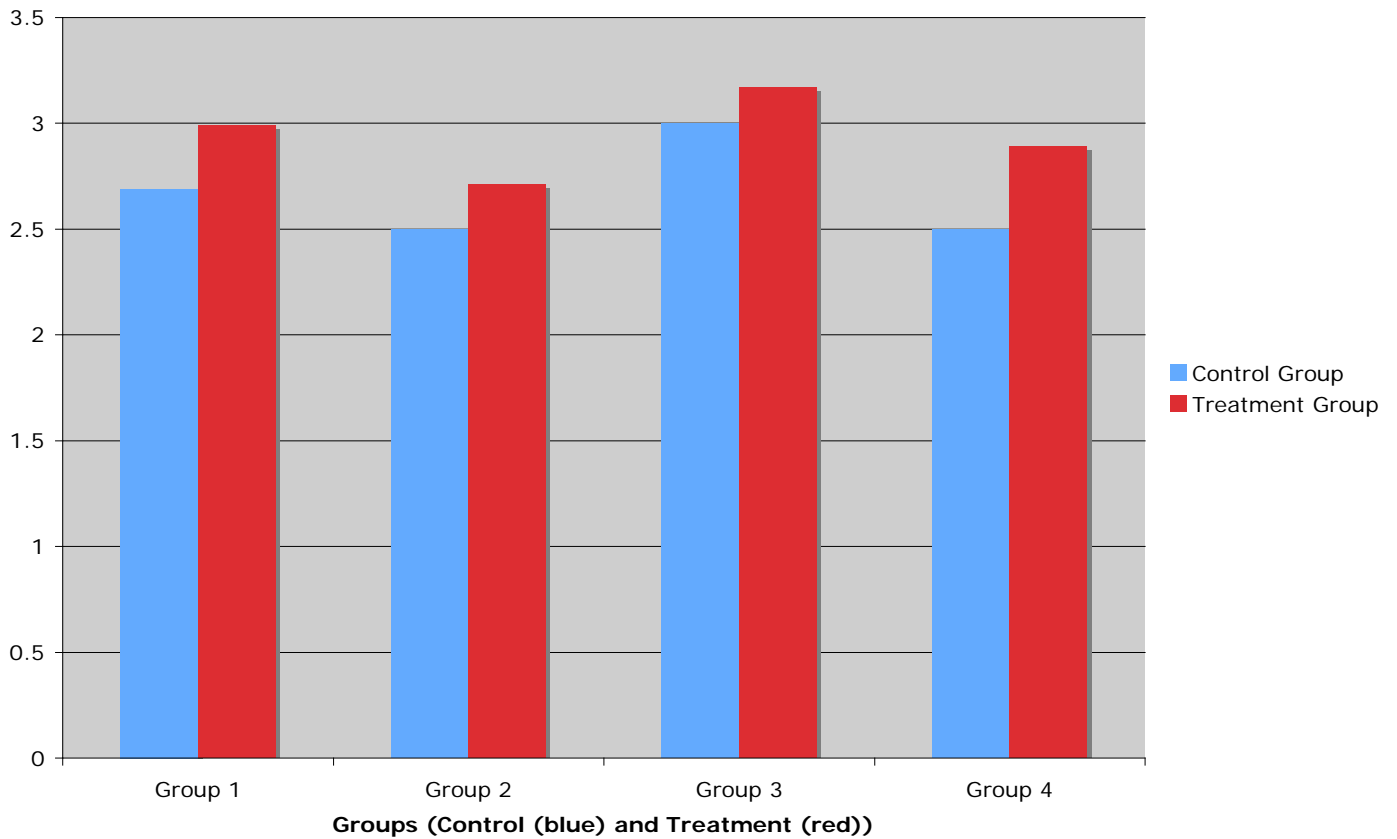


Figure 1

Table 1: Intragroup Comparison, sealed vs. non-sealed surface on Shade (Paired t-tests).

Group	Treatment Type	P-value	Statistical Significance (p < 0.05)
Group 1	Select Defense, Etched	0.0685	No
Group 2	Select Defense, Non-etched	0.0675	No
Group 3	Pro-seal, Etched	0.1752	No
Group 4	Pro-Seal, Non-etched	0.0685	No

Table 2: Intragroup Comparison, sealed vs. non-sealed surface on Value (Paired t-tests)..

Group	Treatment Type	P-value	Statistical Significance (p < 0.05)
Group 1	Select Defense, Etched	0.8610	No
Group 2	Select Defense, Non-etched	0.3224	No
Group 3	Pro-seal, Etched	0.2222	No
Group 4	Pro-Seal, Non-etched	0.4730	No

Table 3: Intergroup Comparison, post-treatment on Shade (Unpaired t-test).

Group Comparison	Treatment Differentiation	P-value	Statistical Significance(p < 0.05)
1 vs. 2	Select Defense Etched vs. Non-etched	0.7267	No
3 vs. 4	Pro-Seal Etched vs. Non-etched	0.2642	No
1 vs. 3	Etched Select Defense vs. Pro-Seal	0.4732	No
2 vs. 4	Non-etched, Select Defense vs. Pro-Seal	0.4233	no

Table 4: Intergroup Comparison, post-treatment on Value (Unpaired t-test).

Group Comparison	Treatment Differentiation	P-value	Statistical Significance (p < 0.05)
1 vs. 2	Select Defense Etched vs. Non-etched	0.6096	No
3 vs. 4	Pro-Seal Etched vs. Non-etched	0.3352	No
1 vs. 3	Etched Select Defense vs. Pro-Seal	0.3526	No
2 vs. 4	Non-etched, Select Defense vs. Pro-Seal	0.6104	No

CONCLUSIONS

The result of this in vitro study demonstrated that SeELECT Defense Sealant does not significantly change the color of the teeth on application using any method.

In an effort to gain a visual perspective different from that of the ShadeEye chromometer, visual inspections were carried out independently by 3 different clinicians on each of the experimental groups. Employing visual color perception of the teeth, first before the treatment and then a second after completion of the treatment, the three clinician-observers reported no significant color change following application of both sealants, SeELECT Defense and Pro Seal.