

Influence of the Retention of Antiseptic Solution Dyes on the Translucence of Glass-Ionomer Cements

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Due to the great importance that antiseptic solutions have on the control and prevention of oral diseases and their influence on the translucence of esthetic restorative materials, the present study evaluated the effect of antiseptic solutions on the translucence of two glass-ionomer cements, Vidrion R and Chelon Fil, at eight time periods. Four antiseptic solutions were used: Listerine, Malvona, Flogoral and Plax. Vidrion R was less translucent than Chelon Fil. Translucence decreased with longer observation time and Malvona caused the lowest translucence.

Key Words: translucence, glass-ionomer cement, antiseptic solutions.

INTRODUCTION

In the last years, Curative Dentistry has been losing ground to Health Promoting Dentistry and currently, there is emphasis on the prevention and control of both caries and periodontal disease. Thus, restorative and preventive sectors must work together. The restoration of the dental element must be preventive, with adequate properties and the capacity to promote and stimulate oral health from the restorative materials.

The glass-ionomer cements, considered to be a remarkable esthetic restorative material, are made from silicate cement powder and the liquid of zinc polycarboxylate cement. The excellent properties of each of these elements are combined, obtaining a material with adherence to both enamel and dentin, with biocompatibility and fluoride release (1-5). Materials that release fluoride and have the capacity to recover it and then release it during cariogenic challenge are adequate for the oral environment and for the construction of esthetic restorations of high caries risk patients because

these materials may restore and prevent dental caries (6,7).

Antiseptic solutions, when added to the techniques of oral hygiene, contribute to periodontal and dental health. Despite these benefits, the influence of antiseptic solutions on esthetic restorative materials is questionable, especially concerning the modification of translucence because of the presence of dyes in these solutions (8-14).

Because the translucence of a restorative material as well as the different behavior of each material (12,15,16) are important factors in the esthetics of restorations, the objective of the present study was to observe the effect of the retention of antiseptic solution dyes on the translucence of glass-ionomer cements as a function of material, time and immersion solution.

MATERIAL AND METHODS

Two conventional glass-ionomer cements, Vidrion R and Chelon Fil, and four antiseptic solutions,

Listerine (yellow), Flogoral (green), Plax (red) and Malvona (brown), were used in this study (see Table 1 for manufacturers). Five samples were constructed for each experimental condition, i.e., materials and solutions. The samples were then immersed in the respective solutions and maintained at $37^{\circ}\text{C} \pm 1$ until evaluation at 8 time periods: immediately after immersion (T0) and at 1-week intervals for 7 weeks (T1-T7).

Ring-shaped stainless steel matrixes (10 mm in diameter and 2 mm thick) were used for the sample constructions. Materials were manipulated according to manufacturer recommendations so that their properties were not altered. After manipulation, the material was placed in the matrix rings, which were placed on a glass sheet previously covered with colorless cellophane and then covered by another cellophane covered glass sheet. A 1,000 g weight was positioned on top of this glass sheet so that the material could flow uniformly and the excess could be eliminated. After reaction, approximately 6 min, the samples were removed from the matrix rings and placed in a thermal insulating container with water for 1 h before the experiment began. A Jouan electrophoresis apparatus (series 021A/No. 10, Jouan, Paris, France) was used to measure translucence (in %).

RESULTS AND DISCUSSION

Evaluation of 40 samples was made with 5 replicates for each material, resulting in a total of 320

Table 1 - Materials tested.

Materials	Batch no.	Manufacturer
Listerine	01880L	Warner Lambert Morris Plains, NJ, USA
Flogoral	1146	Asta Média Ltda São Paulo, SP, Brazil
Plax	12	Colgate-Palmolive/Kolynos do Brazil Osasco, SP, Brazil
Malvona	2000M-03	Laboratórios Prima Ltda Rio de Janeiro, RJ, Brazil
Vidrion R	00E	SS White Ltda Rio de Janeiro, RJ, Brazil
Chelon Fil	0455	ESPE Premier Markham, Germany

measurements. The adherence test to normal curve was applied, which showed that the sample distribution was normal. Analysis of variance was performed in order to observe whether there was a significant difference among the materials in study (solutions and times) as well as a possible interaction among the factors. Significance was detected for all factors (material, solution and time; $p < 0.05$) as well as for the interactions material x time ($p < 0.05$) and material x solution ($p < 0.05$).

In order to study the significant differences among the levels of a determined factor, Tukey's test was used with a significance level of $p < 0.05$. The materials presented different levels of translucence: Vidrion R was less translucent than Chelon Fil (Table 2). These results showed that, when analyzed alone, the material Vidrion R was more susceptible to the action of antiseptic solutions, considering that the lower the percentage of translucence, the larger the stain in the sample, i.e., less quantity of light goes through the sample. These data are in accordance with Simões (10) who, although using different solutions of immersion, detected that,

Table 2. Translucence means (%) for the material factor.

Vidrion R	Chelon Fil
14.08	26.93

Critical value of Tukey: 0.59

Table 3. Translucence means (%) for the time factor.

T0	T1	T2	T3	T4	T5	T6	T7
24.95	24.30	22.55	20.60	19.35	18.27	17.35	16.70

Critical value of Tukey: 1.47

T0 = immediately after immersion

T1 - T7 = 1 week intervals for 7 weeks

Table 4. Translucence means (%) for the solution factor.

Listerine	Flogoral	Plax	Malvona
23.55	20.78	21.17	16.52

Critical value of Tukey: 0.91

among three different commercial brands of glass-ionomer cements, Vidrion R presented the lowest value of translucence. This low percentage of translucence in the first available ionomeric cements was also observed by other researchers (1-4,16,17). Duke and Trevino (15) suggested that manipulative properties of the cement must be followed rigorously because powder excess could cause a decrease in translucence. In addition, Earl et al. (8) and Marks et al. (18) emphasized the importance of the initial superficial protection of the material since it is highly susceptible, especially in the first 24 hours. According to Christensen (5), Knibbs et al. (9) and Akashi et al. (19) the continued modifications in the formulations improved their properties, mainly in terms of translucence.

The significance of the time factor indicates that, when alone, there is an influence on translucence levels. In order to show where these effects occur, Table 3 presents translucence means in percentage for the time factor. T0 and T1 were statistically equal and had higher percentages of superficial translucence than the other time periods that then followed in decreasing order with T7 being the least translucent. In other words, the higher the time of material immersion, the lower the translucence value. These data are in agreement with Simões (10) who reported increasing translucence values until the first 24 hours and decreasing values until the 4th week. Observing the optic properties of esthetic material translucence, Pedrini (11) and Catirse et al. (12) also reported decreasing values.

Concerning the solution factor, there was also an influence on the percentage of translucence of the materials analyzed (Table 4). Listerine (yellow color) had the highest percentage of translucence and Malvona (brown color) the lowest percentage. Flogoral (green color) and Plax (red color) had an intermediate level, Plax having a higher percentage of translucence than Flogoral.

We may conclude that Vidrion R was less translucent than Chelon Fil; longer immersion caused less translucence; samples immersed in Malvona were the least translucent of the materials studied, and those immersed in Listerine were the most translucent. Thus, the results of this study suggest that the clinical use of Listerine as an antiseptic solution for a short period of time may interfere less intensively with the translucence of the restorative material Chelon Fil.

RESUMO

Catirse ABE, Dinelli W, Garcia PPNS, Corona SAM. Influência da retenção de corantes de soluções antissépticas na translucidez de cimentos de ionômero de vidro. *Braz Dent J* 2001;12(2):91-94.

Devido a grande importância que tem as soluções anti-sépticas no controle e prevenção das doenças bucais e a influência da translucidez dos materiais restauradores estéticos sobre a aparência dos mesmos, o presente trabalho avaliou, o efeito de soluções anti-sépticas sobre a translucidez de dois cimentos de ionômero de vidro, Vidrion R e Chelon Fil, durante oito medidas. Quatro soluções anti-sépticas foram usadas, Listerine, Malvona, Flogoral e Plax. Os resultados foram submetidos a análise de variância, Vidrion R apresentou menor translucidez que o Chelon Fil. A translucidez diminuiu com o tempo de observação e a Malvona foi a solução que resultou na menor porcentagem de translucidez.

Unitermos: translucidez, cimento de ionômero de vidro, soluções anti-sépticas.

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