BIS-ACRYL RESIN COLOR EVALUATION BEFORE AND AFTER SURFACE TREATMENTS AND IMMERSION IN COLORING BEVERAGES

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ABSTRACT

This study evaluated the color stability of a bis-acryl composite resin (specimens - disks) submitted to different surface treatments and diverse time immersion in coloring beverages. To obtain the coordinates L*a*b*, the disks were measured in a spectrophotometer before immersion (T0), after 7 (T1) and 20 days (T2). The color differences (\(\Delta E_{ab}\)) obtained for all the experimental groups were analyzed with the ANOVA, and multiple comparisons were performed by the Tukey HSD test (\(\alpha=0.05\)). Regardless the bis-acryl composite resin surface treatment, the excessive administration of coffee always promotes the resin pigmentation.

Keywords: provisional prostheses, bis-acryl composite resin, color, colorants.

INTRODUCTION

Recently, the bis-acryl composite resin has been used to make provisional restorations, since it presents a lower contraction of polymerization and reduced exotherm when compared with acrylic resins (Givens \textit{et al.}, 2008). In addition, bis-acryl resins are easy to handle, have a polishing facility, and can be used for short and long periods (Rutkunas \textit{et al.}, 2010). However, the probability of staining during clinical use is a major clinical problem, since it even led to a frequent provisional prostheses replacement (Bayindir \textit{et al.}, 2012). This feature may be associated to different factors, such as coloring agents, intrinsic characteristics of the material and polishing capability (Rutkunas and Sabaliauskas, 2009).

Thirty bis-acryl composite resin discs (12mm diameter and 3mm thickness) (Color A2, Protemp 4®, 3M Espe, USA) were performed and divided into three groups. Ten disks (G1) were cleaned with gauze soaked in alcohol, according to the manufacturer's instructions; ten disks (G2) were cleaned the same way, and after, they were finished with abrasive disks (Praxis®, TDV Dental, Brazil); and to the other remaining disks (G3) was given the same finishing G2 protocol, followed by rubberized spiral disk (Soflex®, 3M ESPE, USA) and diamond paste (Diamond AC I and II, FGM®, Brazil). Five disks of each group were immersed in coffee-based solutions (Nescafé®, Nestlé Brazil, Brazil) and cola-based soft drink (Coca-Cola®, Coca-Cola Company, USA) for 7 and 20 days. The color of the disks was measured by a spectrophotometer (Minolta CM 3600A, Konica Minolta®, Japan) before immersion (T0), and after 7 (T1) and 20 days (T2). For the measurement, the excluded component (SCE) and the illuminant D65 were considered. The color differences (\(\Delta E_{ab}\)) were
calculated by CIELab System, comparing the L*a*b* coordinates of the experimental groups with the standard color reference of the bis-acryl resin employed. Statistical analysis was made by one and two-way ANOVA, and multiple comparisons were performed by the Tukey HSD test (α=0.05).

RESULTS AND CONCLUSIONS

The L*a*b* coordinates of the experimental groups are shown in Table 1. Table 2 shows the mean of the color differences (ΔE_{ab}) for the coloring beverages employed in this study.

The largest color differences were found when disks were immersed in coffee for 20 days (P<0.001). The Tukey HSD test showed that the behavior of the three groups immersed in coffee for 20 days (T2) was similar (α=0.05). When the disks were immersed in cola-based soft drink, the color differences found (between 1.65 and 3.06ΔE_{ab}) did not showed significant differences between groups (P=0.010) or immersion times (P=0.026).

This study shows that the excessive coffee exposure may stain provisional prostheses made of bis-acryl composite resins, regardless of the surface treatment used.

REFERENCES


