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Effect of Mouthwashes on Optical Properties of Novel Zirconia Ceramics

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Objectives Mouth rinses can lead to adverse effects such as discoloration of restorative materials.The purpose of this study was to investigate the effect of mouth rinses on the color and translucency of two new generation CAD/CAM zirconia ceramic materials.

Methods Forty specimens were fabricated from each zirconia ceramic (totally 80 specimens): monolithic zirconia (VITA YZ HT) and multilayered zirconia (IPS emax ZirCAD Prime). Each subgroup (n=10) was immersed in one of the following four solutions: distilled water, chlorhexidine (%0.2), Listerine Mouthwash (advanced white) and Glimo Care mouthwash for 180 hours. The baseline color values were recorded according to the CIElab system with a spectrophotometer (Vita Easyshade 4.0). The color coordinates (L*, a*, b*) of the specimens were measured before and after immersion and TP (translucency parameter), ΔE (color difference) values were calculated by using the CIEDE2000 color difference formula. The data were analyzed by two-way ANOVA followed by Tukey's post-hoc tests (α = 0.05).

Results Color changes occurred in the experimental groups . The ΔE*ab values were significantly greater in IPS Emax ZirCAD PRIME compared to VITA YZ HT ($p<0.001$).Mouthrinse type also significantly affected the ΔE value($p=0.004$). In post hoc comparisons, the difference was found to be due to the lower ΔE value of ceramics immersed in chlorhexidine (0.97±0.63), compared to Glimo Care (1.36±0.91) and Distilled water (1.11±0.68). The ceramic type had an impact on TP values difference , but the change over the immersion time was not statistically significant. It was found that the mouthwash type did not have a significant effect on TP change ($p=0.144$).

Conclusions In both novel zirconia types, color change was observed after immersion in mouthrinses. The color change was greater in the multilayered zirconia ceramic. Chlorhexidine caused less discoloration in both ceramic types. Glimo Care reduced the translucency, while Listerine increased.