Influence of Chromatic Color in Background on the Color of Composite Resin

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Abstract: Recently, improvements in the adhesiveness of composite resins, increased esthetic demands made by patients, and wider acceptance of the concept of MI have led to the more frequent use composite resins for esthetic restorations. In order to achieve highly esthetic restorations, it is important to select the color of the composite resin by taking in to account the effects of surrounding colors. With higher esthetic demands, composite resins that are used for filling are applied in layers, and due to the chameleon effect, it is now possible to achieve restorations that closer to the color of natural teeth. However, when matching colors in clinical settings, various conditions need to be considered with respect to shade selection and morphological recovery, and this requires considerable skill. In this study, the effects of base chromatic colors on the colors of composite resins were investigated.

In this study, the following four composite resins were used: Beautiful II, Estelite Σ, Filtek™ Supreme DL, and Tetric Ceram. A3 shade was used in all cases. As bases, the standard white board, black board, and six colors of low-foam vinyl chloride boards were used. Round discs were prepared and placed on each base, and then color analysis was performed using a spectrophotometer. The L* value of the bases in relation to the color of the composite resins was the highest for black, followed by red, blue, green, and yellow, in this order. The a* value was the highest for red and lowest for green, while the b* value was the highest for yellow and lowest for blue. The color difference \( \Delta E*_{ab} \) between the standard white board and each base was the highest for white, followed by green, blue, yellow, red, and black, in this order. With each composite resin, the color difference \( \Delta E*_{ab} \) for each base was calculated in relation to the color measured on the standard white board. For all composite resins, \( \Delta E*_{ab} \) was the highest for white, followed by yellow, red, green, black, and blue, in this order.

The fact that there were differences between the color difference of the bases and color difference of the composite resins on bases with different colors, indicates that the color of the composite resins is affected by not only base brightness, but also base saturation. Based on color differences, the color of the composite resins is less likely to be affected by red and green base colors.

Key words: Composite resin, Color, Background color