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Title: Decision Support System for Predicting Color Change after Tooth Whitening

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Decision Support System for Predicting Color Change after Tooth Whitening

Abstract

Tooth whitening is becoming increasingly popular among patients and dentists since it is a relatively noninvasive approach. However, the degree of color change after tooth whitening is known to vary substantially between studies. The present study aims to develop a clinical decision support system for predicting color change after in-office tooth whitening. We used the information from patients' data sets, and applied the multiple regression equation of CIELAB color coordinates including L^* , a^* , and b^* of the original tooth color and the color difference (ΔE) that expresses the color change after tooth whitening. To evaluate the system performance, the patient's post-treatment color was used as "gold standard" to compare with the post-treatment color predicted by the system. There was a high degree of agreement between the patient's post-treatment color and the post-treatment color predicted by the system (Kappa value = 0.894). The results obtained have demonstrated that the decision support system is possible to predict the color change obtained using an in-office whitening system using colorimetric values.

Keywords: tooth whitening; decision support system; multiple regression.

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