COMMENTARY

EFFECT ON ENAMEL MICROHARDNESS OF TWO CONSUMER-AVAILABLE BLEACHING SOLUTIONS

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This article answers one more of the many questions surrounding the effect of bleaching on enamel. It is a complex puzzle that still requires many pieces to complete.

We know that hardness in enamel increases whenever specimens are exposed to fluoride.¹ Caries susceptibility of enamel is also decreased when fluoride is added to bleaching agents.² When enamel specimens are stored in water, there usually appears to be a rapid loss in microhardness,³ but when they are stored in saliva, there is usually no loss.^{4–6} Therefore, the critical item to note when reading an article on this subject is whether the work was accomplished in vitro, in situ, or in vivo.

A recent article reported on the changes in enamel microhardness after bleaching for 14 days when accomplished in situ versus in vitro. The samples were bleached for 8h/d with 10% carbamide peroxide. The samples were then stored in deionized water or placed intraorally on a removable appliance for the other 16 h/d. Justino and colleagues concluded "that specimens bleached in situ showed similar microhardness to unbleached specimens and had higher microhardness than in vitro bleached specimens."⁷

Another study on changes in microhardness of enamel was conducted with chips of enamel embedded in an oral appliance; the appliance was worn for 24 h/d for 21 days.⁸ Bleaching was accomplished with trays placed over the samples for 1 or 7 hours. Control specimens were also on the oral appliance. There was no difference in enamel microhardness between the different bleaching treatment regimens and the control.

The current study contributes another piece of the complex puzzle on the effects of bleaching on enamel. In group 4 we should expect some loss of microhardness due to the phosphoric acid in the formulation of the product. Sodium percarbonate, used in group 3, is a newly introduced agent on the bleaching market, and we have no comparative data on its effects on enamel. The 7-day loss in microhardness after bleaching in that group will need further investigation. Group 2, in which 10% carbamide peroxide, the most commonly used bleaching agent, was used demonstrated no loss in microhardness. This study provides some useful insight into the effects of bleaching on the microhardness of enamel, but much more work is necessary to help us fully understand the interaction of our bleaching agents with tooth structure.

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