COMMENTARY

EFFECT OF LIGHT IRRADIATION ON TOOTH WHITENING: ENAMEL MICROHARDNESS AND COLOR CHANGE

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I congratulate the authors for a thought-provoking, thorough, and clinically pertinent study. Research on tooth whitening, well referenced in the article, has been concentrated on the relative effectiveness of various concentrations of hydrogen peroxide, use of heat or light to speed and/or increase the whitening effect, comparisons of in-office and at-home bleaching, and more recently, on the effect of whitening on tooth surfaces.

Whitening teeth has become a popular technique globally, with high patient demand and relative success. Several decades ago, the in-office bleaching concept was used with minimal research but obvious clinical success. It was thought that heat and/or light applied to hydrogen peroxide in various forms on tooth surfaces increased the potential of the chemical to whiten teeth. The older techniques were laborious, painful, and potentially dangerous. I was pleased when the at-home whitening concept became popular, thereby making whitening easier and less painful for patients and freeing clinical operatory space for more mandatory oral therapies. However, a resurgence of in-office tooth whitening has been promoted by some manufacturers, claiming superiority of their products using light in the whitening process.

Thanks to the current authors for again showing the ineffectiveness of lights to increase or speed tooth whitening, our group, Clinicians Report (formerly Clinical Research Associates), showed the ineffectiveness of that concept numerous years ago,[1] and other investigators have shown similar findings.[2,3] Nevertheless, some manufacturers persist in influencing dentists to use lights when whitening teeth, claiming that the newest versions of their bleaching lights are more effective than those tested in the past. To date, those claims continue to be refuted by independent research. Unknowing patients ask dentists to use lights when whitening. I suggest that practitioners become familiar with the research articles showing light ineffectiveness and that they show questioning patients these research reports.

The effect of whitening on tooth enamel has been a subject of interest not only to dentists but also to concerned patients. Most practitioners have been asked by patients if tooth whitening is damaging to their teeth. As referenced in the current article, research reports have been somewhat contradictory concerning damage to enamel. The current investigators showed some reduction in enamel hardness caused by a high concentration of one brand of hydrogen peroxide. Is this clinically significant? If it is, how significant is the minor change in enamel hardness? When scientific research is contradictory, the initial authors of the evidence-based concept advise practitioners to integrate the contradictory research with clinical observations. There have been millions of teeth whitened by hydrogen peroxide over several decades of observation by dentists and patients. It appears that any minor changes in enamel hardness or other potentially damaging effects are of little or no *clinical* significance. However, we do not know the significance of tooth whitening when it is used to an extreme. It is well known that some patients use hydrogen peroxide excessively because many relatively inexpensive brands are readily available to the lay public. Patients need to be cautioned by practitioners that the local and systemic negative characteristics of *long-term* excessive use of hydrogen peroxide are unknown.

I predict that whitening teeth will continue to be used on a routine basis by millions of people and that it will remain the fastest and easiest entry portal to esthetic dentistry procedures.

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