



Benefit of Light vs No Light

in vivo study

Clinical Trial: Photo-Fenton and Conventional In-Office Dental Bleaching

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Objective

To evaluate the efficacy of two in-office dental bleaching methods on shade change and color stability (ΔE).

Materials

- 25% hydrogen peroxide with light activation (Zoom2 + Zoom AP Light, Discus Dental, Inc.)
- 38% hydrogen peroxide (Opalescence Xtra Boost, Ultradent, Inc.)

Methodology

Sixty healthy adult volunteers were randomly divided into three experimental groups of 20 subjects each. The groups were treated as follows: the ZAP1 group received one treatment with 25% hydrogen peroxide and light activation (Zoom2 + Zoom AP Light, Discus Dental); the OPX2 group received two treatments with 38% hydrogen peroxide (Opalescence Xtra Boost, Ultradent); the OPX3 group received one treatment with 38% hydrogen peroxide (Opalescence Xtra Boost, Ultradent). Each treatment consisted of three applications of bleaching gel for 15 minutes each.

Experimental	Description
ZAP1 (n=20)	25% hydrogen peroxide with light (Zoom2 + Zoom AP Light, Discus Dental)—1 treatment session
OPX2 (n=20)	38% HP—Opalescence Xtra Boost (Ultradent)—2 treatment sessions
OPX1 (n=20)	38% HP—Opalescence Xtra Boost (Ultradent)—1 treatment session

The shade of superior incisors and canines was assessed for each subject using a digital Vita-Easysshade Spectrophotometer immediately before and after the whitening treatment at 7, 14 and 30 days.

The Vita-Easysshade device measures the color based on a tridimensional system that supplies numerical values, which are inserted into a formula to provide color or shade variation (also known as ΔE). A custom clear EVA tray was used to ensure that measurements were taken at the same spot on each tooth. Holes in the tray on the labial surface of incisors and canines were made with a specially designed 6 mm bur corresponding to the size of the tip of the optical spectrophotometer reader.

Results

Homogeneity and homoscedasticity tests were applied to the data obtained which indicated that two way ANOVA and Tukey test were the best tests to treat the results. All treatment groups showed increased whitening over baseline shade at 7, 14 and 30 days post bleaching. Groups ZAP1 and OPX2 presented statistically similar bleaching results, exceeding the results obtained for OPX1 group. All groups presented shade stability over the 30-day period evaluated in this study.

Conclusion

For more than a century, in-office dental whitening treatment has been performed in much the same way, using hydrogen peroxides in high concentrations that vary between 30 to 38%. Light and heat may be used to accelerate the HP chemical reaction (Photo-Fenton reaction) so that a lower concentration of HP can be used. In this trial, one treatment using the whitening system based on the Photo-Fenton reaction (25% HP) produced whitening results equivalent to two treatments treatment with 38% HP (without light activation) and exceeded whitening achieved with one session with 38% HP (without light activation).

Whitening Results

Color Change

