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Translating the Science

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Colgate Optic White Overnight Teeth Whitening Pen Laboratory Evaluation

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INTRODUCTION:

Among the many whitening products on the market, whitening gels which can be placed for longer periods can allow the active ingredient time to work. Higher percentages of whitening agents like hydrogen peroxide may work faster, but with the potentially greater risk of sensitivity if used improperly. Some whitening agents use greater than 30% hydrogen peroxide or over 40% carbamide peroxide which are only considered safe for in-office use.

In this study, we measured the whitening effect of ***Colgate® Optic White® Overnight Teeth Whitening Pen*** which is indicated for OTC use with 3% hydrogen peroxide overnight, or for several hours per use. We used stained bovine teeth which were treated, stored in a humid environment and color change measured with a spectrophotometer. We compared the whitening effect to a placebo pen without hydrogen peroxide to measure the total change in color by the whitening pen.

STUDY DESIGN:

Commercially sourced stained and mounted bovine teeth were split into 2 groups with 12 replications each. One group was treated with the Colgate Optic White Overnight Whitening Pen and one group was treated with a placebo product.

Tooth color was measured at baseline, after 3 treatments and after 7 treatments with a ***Spectroshade Micro II Spectrophotometer*** (MHT Optic Research, Switzerland) which provides L*a*b* color coordinates.

The L*, a*, and b* values were used to calculate the change in the whiteness index for each tooth after the 3rd and 7th treatment cycle when compared to the baseline reading. Whiteness is reported as ΔW*.

Whiteness Index

$$W^* = (a^{*2} + b^{*2} + (L^* - 100)^2)^{1/2}$$

$$\Delta W^* = W^* \text{ treated} - W^* \text{ baseline}$$

A more negative ΔW* indicates a closer resemblance of the tooth color to white.

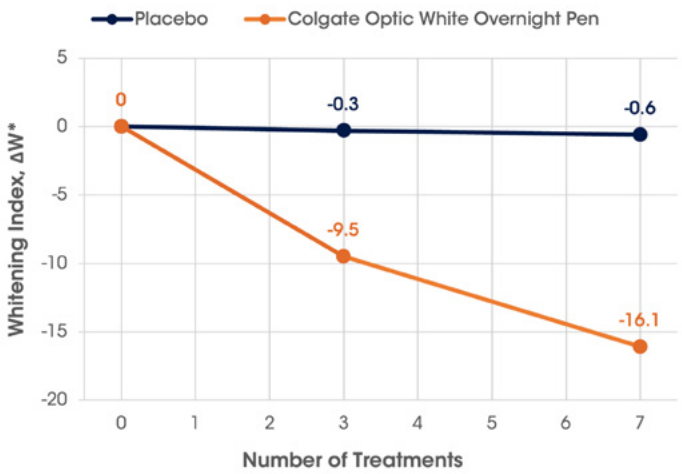
The teeth were treated similar to product usage instructions. The teeth are dried with a tissue prior to application. A thin layer of formula is applied onto each tooth's surface and then allowed to dry for several seconds. The treated teeth are placed in a sealed jar covered in wet towels to produce a humid environment overnight. The next day, the clear coating is removed. This process is repeated for 7 treatment cycles for the Colgate Optic White Overnight Whitening Pen and the placebo product.

RESULTS:

The results graph on the right shows the Whitening Index results, ΔW*, for the Colgate Optic White Overnight Whitening pen and the placebo product after 3 and 7 overnight treatments. A more negative ΔW* indicates a closer resemblance of the tooth color to white.

The Colgate Optic White Overnight Whitening pen produced a statistically significant whitening effect after only 3 treatments and continued through 7 treatments compared to the placebo product without hydrogen peroxide which showed minimal change in color on the stained bovine teeth and was not statistically significant.

Whitening Performance



CONCLUSION:

The results of this in vitro whitening study demonstrated that the ***Colgate Optic White Overnight Whitening*** pen exhibited significantly better whitening than the placebo formula after 3 and 7 overnight treatments.

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