Effectiveness of a New Dentifrice with Baking Soda and Peroxide in Removing Extrinsic Stain and Whitening Teeth

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Abstract

- **Objective:** The primary purpose of this randomized, controlled, six-week clinical trial was to determine the effectiveness and safety of a new whitening dentifrice in removing extrinsic tooth stain and whitening teeth. An additional two-week exploratory study was conducted to determine whether the whitening or stain-prevention activity of the dentifrice would persist following cessation of use.

- **Methods:** In the first study (Phase I), one-hundred and forty-six qualifying subjects were randomly assigned to either a sodium bicarbonate whitening dentifrice group (Arm & Hammer® Advance White® Extreme Whitening Baking Soda and Peroxide Toothpaste) or a silica-based negative control dentifrice group, and brushed twice daily with their assigned dentifrice for six weeks. Tooth shade on the labial surfaces of the eight incisors was assessed using a Vita Classic shade guide, and extrinsic tooth stain was scored using a Modified Lobene Stain Index (MLSI) at baseline, week 4, and week 6. In Phase II (after the week 6 examination), volunteers from the Arm & Hammer whitening dentifrice group were randomly assigned to continue using the whitening dentifrice or to use the negative control dentifrice twice daily for two weeks. The six-week shade and stain index scores served as the baseline for this exploratory phase and were rescoring after two weeks.

- **Results:** The whitening dentifrice group had statistically significant (p < 0.0001) mean shade score reductions of 1.82 and 2.57 from baseline to weeks 4 and 6, respectively. For the same periods, the negative control dentifrice group was virtually unchanged from baseline. For tooth stain, the MLSI total mean scores for the whitening dentifrice group showed statistically significant (p < 0.0001) decreases from baseline of 1.42 (41.6%) and 2.11 (61.6%) at weeks 4 and 6, respectively. In contrast, the negative control dentifrice group had a MLSI reduction of 0.07 at week 4 and a 0.06 increase at week 6. Between-group analyses using baseline-adjusted ANCOVA showed the whitening dentifrice to be statistically significantly more effective (p < 0.0001) than the negative control for shade and tooth stain reductions for all index comparisons. Compared to the six-week (baseline) scores, subjects who continued to use the whitening dentifrice for the additional two weeks experienced statistically significant (p < 0.0001) further mean reductions of 0.88 in shade score and 0.46 in MLSI score, while subjects who switched to the negative control dentifrice experienced smaller, statistically significant (p < 0.05) reductions of 0.34 in shade score and 0.13 in total MLSI score.

- **Conclusion:** The Arm & Hammer whitening dentifrice tested in this study is effective for removing extrinsic tooth stain and whitening teeth. While the results also suggest that this dentifrice may have stain-prevention activity that persists following cessation of product use, such activity would need to be confirmed with further studies.

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