

Comparison of Clinical Efficacy of Three Toothpastes in Reducing Dentin Hypersensitivity

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Study objective:

The objective of the study was to compare the efficacy of a dentifrice containing 8% strontium acetate (test product) to a desensitizing dentifrice containing 8.0% arginine and calcium carbonate (positive control) and a regular fluoride toothpaste (negative control) in reducing dentin hypersensitivity instantly after a single direct topical self-application of the dentifrice using a fingertip and after subsequent twice-daily brushing for seven days.

Trial conditions and methods

Products under investigation

Test dentifrice: Sensodyne® Rapid Relief Toothpaste (GSK Consumer Healthcare, UK) containing 8% strontium acetate and 1040 ppm fluoride as NaF.

Positive control dentifrice: Colgate® Sensitive Pro-Relief™ Toothpaste (Colgate-Palmolive, New York, NY) containing 8.0% arginine, calcium carbonate and 1450 ppm fluoride as MFP.

Negative control dentifrice: Crest® Cavity Protection Toothpaste (Procter & Gamble Co., Cincinnati, OH) with 1100 ppm fluoride as NaF.

Study subjects

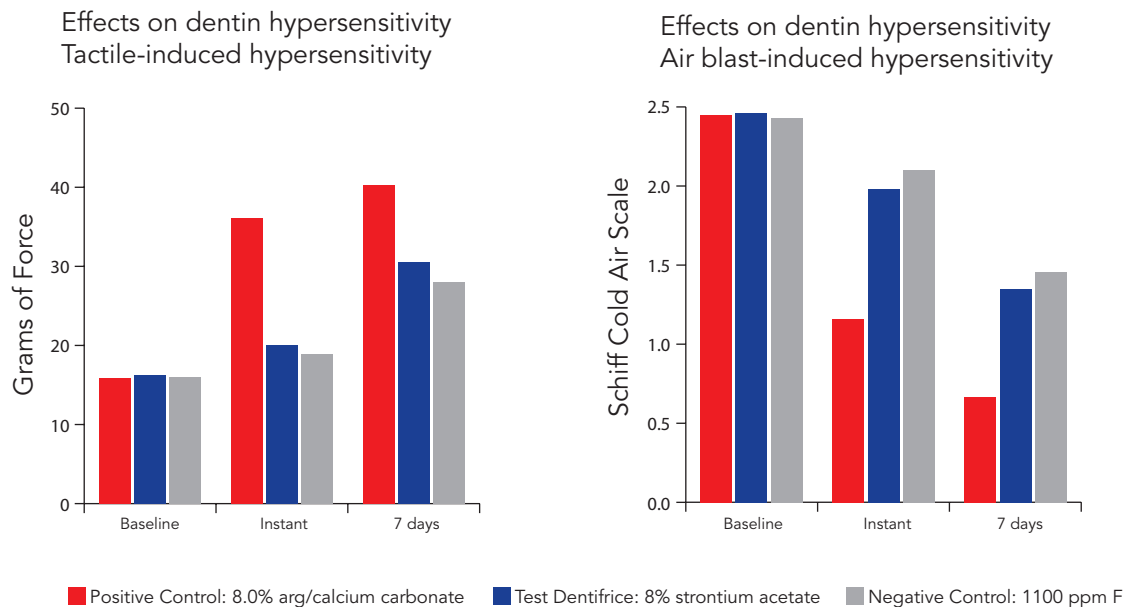
A total of 150 male and female subjects (aged between 18 and 69 years) with established dentin hypersensitivity (two hypersensitive teeth with a tactile score [Yeaple probe] of 10-50 grams of force and air blast score of 2 or 3 on the Schiff Cold Air Sensitivity Scale).

Methods

In this double blind, parallel group study, 150 subjects with established dentin hypersensitivity were randomly assigned to the test group, the positive control group or the negative control group (N=50 for each group). Following baseline evaluation of dentin hypersensitivity, subjects used a fingertip to self-apply a pea-size amount (approximately 0.3 grams) of their assigned product directly onto the hypersensitive surface of the study teeth and massaged each tooth for 1 minute. Tactile and air blast sensitivity scores were determined immediately after direct topical application and after brushing twice daily for seven days with the assigned product. Statistical analyses were performed separately for tactile and air blast scores. Within-treatment comparisons were performed using paired t-tests. Comparisons between treatments using baseline adjusted scores were performed using analyses of covariance (ANCOVA). All statistical tests of hypotheses employed a level of significance of $\alpha=0.05$.

Results

No statistically significant differences in tactile or air blast hypersensitivity scores were indicated among the baseline dentin hypersensitivity scores for the three study groups. Immediately after direct fingertip product application, subjects assigned to the positive control group demonstrated statistically significant dentin hypersensitivity improvements as compared to subjects assigned to the negative control group and the test dentifrice group in tactile (91.0% and 80.5%, respectively) and in air blast sensitivity scores (44.8% and 41.4%, respectively). At the same time points, no statistically significant differences were indicated in tactile or air blast dentin hypersensitivity improvements between the test dentifrice group and the negative control group. After 7 days of twice-daily brushing, subjects assigned to the positive control group demonstrated statistically significant dentin hypersensitivity improvements as compared to subjects assigned to the negative control group and the test dentifrice group in tactile scores (43.9% and 32.1%, respectively) and in air blast sensitivity scores (54.1% and 50.4%, respectively). At the same time points, no statistically significant differences were indicated in tactile or air blast dentin hypersensitivity improvements between the test dentifrice group and the negative control group.



Conclusions

Colgate® Sensitive Pro-Relief™ toothpaste containing 8.0% arginine, calcium carbonate and 1450 ppm fluoride as MFP provides a statistically significant reduction in dentin hypersensitivity as compared to a negative control toothpaste and a toothpaste containing 8% strontium acetate and 1040 ppm fluoride as NaF, instantly when self-applied directly onto the sensitive area of teeth with the use of a fingertip and after subsequent twice-daily brushing with the product for 7 days. The toothpaste containing 8% strontium acetate and 1040 ppm fluoride as NaF does not provide statistically significant dentin hypersensitivity improvements from baseline compared to the negative control, either instantly after direct application or after 7 days of twice-daily brushing.