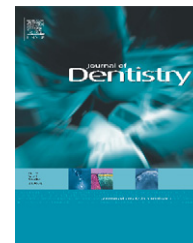


Available online at www.sciencedirect.com

SciVerse ScienceDirect

journal homepage: www.intl.elsevierhealth.com/journals/jden

Efficacy in reducing dentine hypersensitivity of a regimen using a toothpaste containing 8% arginine and calcium carbonate, a mouthwash containing 0.8% arginine, pyrophosphate and PVM/MA copolymer and a toothbrush compared to potassium and negative control regimens: An eight-week randomized clinical trial

Augusto R. Elias Boneta^{a,*}, Karol Ramirez^a, Joselyn Naboia^b, Luis R. Mateo^c, Bernal Stewart^d, Foti Panagokos^d, William De Vizio^d

^a University of Puerto Rico, School of Dental Medicine, San Juan, Puerto Rico, USA

^b Calle Juan Bautista, Vicini #5, Condominio Delfin, Santo Domingo, Dominican Republic

^c LRM Statistical Consulting, Hoboken, NJ, USA

^d Colgate-Palmolive Technology Center, Piscataway, NJ, USA

ARTICLE INFO

Article history:

Received 25 June 2012

Received in revised form

16 November 2012

Accepted 17 November 2012

Keywords:

Efficacy

Dentine

Hypersensitivity

Mouthwash

Tactile

Air-Blast

ABSTRACT

Objective: Evaluate the efficacy of three regimens integrating toothpaste, toothbrush and mouthwash in reducing dentine hypersensitivity.

Methods: Eight-week single-centre, three-cell, double-blind, randomized study was conducted in the Dominican Republic. Subjects entered one of the three regimens: (1) toothpaste containing 8% arginine and 1450 ppm mono-fluorophosphate, in a calcium carbonate base, a soft-bristle toothbrush followed by a mouthwash containing 0.8% arginine, PVM/MA copolymer, pyrophosphates, and 0.05% sodium fluoride; (2) toothpaste containing 5% potassium nitrate and 1450 ppm sodium fluoride, a soft-bristle toothbrush, followed by a mouthwash containing 0.51% potassium chloride and 230 ppm sodium fluoride; and (3) toothpaste containing 1450 ppm mono-fluorophosphate, a soft-bristle toothbrush followed by a fluoride/arginine free mouthwash. Tactile and Air-Blast dentine hypersensitivity measurements were performed at baseline, two, four, and eight weeks. For treatment group comparisons, ANCOVA and post hoc Tukey's pair-wise ($\alpha = 0.05$) were used. Kaplan–Meier survival analysis was performed to evaluate Time to Treatment Improvement.

Results: 120 subjects were enrolled, 118 completed the study. The Tactile hypersensitivity mean scores showed statistically significant improvement at two, four and eight ($p \leq 0.001$) weeks in the arginine regime; the potassium regime did not show significant ($p \geq 0.05$) improvement. Air-Blast Hypersensitivity scores had a statistically significant decrease at two ($p = 0.006$), four ($p = 0.006$) and eight ($p = 0.002$) weeks in arginine and potassium regimes ($p \leq 0.05$). The most effective treatment proved to be arginine ($p \leq 0.05$) compared to the potassium regime.

* Corresponding author at: 1928 Calle Orquidea, Santa María, San Juan, Puerto Rico 00927, USA. Tel.: +1 787 758 3919.

E-mail address: Augusto.Elias@upr.edu (A.R. Elias Boneta).

0300-5712 © 2013 Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](http://creativecommons.org/licenses/by-nc-nd/3.0/).

<http://dx.doi.org/10.1016/j.jdent.2012.11.011>

Conclusion: Arginine regimen provided the greatest reduction in Tactile and Air-Blast dentine hypersensitivity compared to potassium and negative control regimens; and provides faster dentine hypersensitivity relief than potassium regimen.

© 2013 Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](#).

1. Introduction

Dentine hypersensitivity is described as a short, sharp pain caused when exposed dentine responds to stimuli.¹ Predominantly, this sharp pain occurs when the root surface becomes exposed through gingival recession uncovering the dentine tubule orifices.² It usually results as a consequence of thermal, evaporative, tactile, osmotic, or chemical stimulus; and it cannot be attributed to other dental conditions.³

The prevalence of dentine hypersensitivity has been reported from 4 to 57%, in adults.⁴ This condition is more common in adults from 20 to 49 years old, with highest prevalence in ages 30–39.¹ In addition, the prevalence of dentine hypersensitivity has been described to be higher in females than males.⁵ Other risk factors include: gingival recession, removal of the tooth's enamel, as well as, consumption of certain foods or drinks.^{6–8} Chemical or physical forces such as a change in temperature and air movement stimulus have been associated with dental hypersensitivity.⁹ Brännström's Hydrodynamic Theory¹⁰ suggests that external stimuli cause movement of the dentine fluid in the tubules, resulting in a pressure change across dentine.¹¹ This stimulates intra-dental nerve response signals that are ultimately interpreted by the brain as pain.¹²

The most common oral health care products for the management of dentine hypersensitivity are toothpastes and mouthrinses. Toothpastes containing potassium salts are frequently used for dentine hypersensitivity.¹³ The mechanism of action of these products is not clear, but it has been proposed that the use of toothpastes leads to a depolarization of the membrane of nerve fibres that prevent repolarization; thus inhibiting the pain sensation.¹⁴ Potassium-based toothpastes may contain additional ingredients such as fluoride, antibacterial ingredients, crystal inhibitors and high cleaning abrasives that can reduce hypersensitivity.¹⁴ A recent review summarizes the inconsistent evidence of efficacy of potassium-based toothpastes in the hypersensitivity reduction compared to fluoride toothpaste.¹³

Clinical studies have assessed the efficacy of potassium salt and sodium fluoride mouthrinses for the treatment of dentinal hypersensitivity.^{15–17} Gillam and his coworkers compared the effectiveness of a 3% potassium nitrate and sodium fluoride mouthrinse with a control sodium fluoride mouthrinse to treat cervical dentine sensitivity.¹⁸ These authors demonstrated that the mouthrinse containing potassium nitrate significantly reduced cervical dentine sensitivity two and six weeks after product use compared to the control mouthrinse. Pereira and Chava compared the effectiveness of dentinal hypersensitivity in the treatment of a 3% potassium nitrate and sodium fluoride mouthrinse to a control mouthrinse containing sodium fluoride, using tactile and cold air sensitivity.¹⁹ At six weeks, the dentine

hypersensitivity of the test mouthrinse was significantly reduced compared to the control mouthrinse that used only the cold air technique. An arginine-calcium carbonate desensitizing toothpaste has proven to be an effective method for the management of dentinal hypersensitivity in vitro and clinical studies.²⁰ Arginine and calcium work together to deposit a dentine-like material (calcium and phosphate) forming a plug and a protective layer on the surface of the dentinal tubules.^{21–23} Several studies have demonstrated the effect of the arginine-calcium carbonate-containing toothpaste on dentine hypersensitivity. A clinical trial using 8.0% arginine, calcium carbonate, and 1450 ppm fluoride toothpaste reduced dentinal hypersensitivity in response to Tactile and Air-Blast dentinal hypersensitivity after two, four and eight weeks of product use compared to a toothpaste containing 2% potassium ions.²¹ In addition, three other studies have observed the same results.^{22–24}

Recently, an arginine-based mouthwash has been developed for the treatment of dentine hypersensitivity base (Colgate-Palmolive Co., New York, NY). This mouthwash has been evaluated in several clinical studies that demonstrate the positive effect on reducing dentine hypersensitivity.^{25–28} There is no evidence that an arginine-based regimen reduces dentine hypersensitivity. The objectives of this study were (1) to evaluate three home care regimens, each comprising the use of a dentifrice, toothbrush and mouthwash on dentine hypersensitivity over an eight-week period; and (2) to determine whether an arginine-based regimen provides faster relief for dentine hypersensitivity than potassium-based and sodium fluoride regimens. Our hypothesis was that an arginine-containing regimen is more effective, thereby providing faster relief for dentine hypersensitivity compared to potassium and negative control regimens.

2. Materials and methods

This clinical study used a randomized; double blind, three-treatment, parallel design. Adult subjects from a private dental clinic in Santo Domingo, Dominican Republic area were enrolled in the study.

Sample size was based on estimates of the standard deviation of 0.527 for Air-Blast and 10.18 for Tactile sensitivity scores. With a sample size of $n = 120$ (40 per group), this test is capable of detecting a change of 7.2 (35%) for Air-Blast and Tactile scores, respectively with 95% confidence, and 80% power.

Prospective study subjects reported to the clinical facility having refrained from all oral hygiene procedures and from chewing gum for 8 h, and from eating and drinking for 4 h prior to their examination.

Download English Version:

<https://daneshyari.com/en/article/6053460>

Download Persian Version:

<https://daneshyari.com/article/6053460>

[Daneshyari.com](https://daneshyari.com)