

Effect of long lasting self-applied colgate sensitive pro-relief tooth paste in dentin hypersensitivity in group of Iraqi patients

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Abstract: The aim of this research is to evaluate clinically the effect of Colgate sensitive pro-relief tooth paste containing 8% arginine- calcium carbonate on Dentin hypersensitivity in group of Iraqi patient. **Material and Method:** Fifty volunteered subjects male and female with mean age between 20-40 years suffering from dentin hypersensitivity from at least two teeth on cold and hot stimuli and not due to dental caries were agreed to participate in this study. At home brushing instruction consisted of brushing their teeth for one minute, twice daily using only the tooth paste provided and to refrain from any other oral hygiene products and procedures throughout the duration of the study. Assessment of the dentin hypersensitivity were carried out with air blast and repeated by the same examiner using the same methods. Record was taken according to Colgate sensitivity visual analog scale graduated from 0 to 10. Records were taken on day zero and after four weeks for each patient on the same visual scale. **Results** Statistical analysis of the total sample demonstrated a highly significant difference between before (32.8667 ± 1.53644) and after four weeks (4.8000 ± 1.44934) of twice daily use of the product ($p = 0.001$), The percentage of changes was slightly higher in males (61.12%) than females (66.12%). **Conclusion:** Colgate sensitive pro-relief tooth paste contains 8% arginine and calcium carbonate used twice daily for four weeks significantly reduces dentin hypersensitivity. It offers significant relief of dentin hypersensitivity in Iraqi patients.

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1. Introduction

Dentin hyper sensitivity has been described as pain arising from exposed dentin, typically in response to chemical, thermal, tactile and osmotic stimuli that can be varied in both frequency and severity(1). Most patients describe it as sharp, shooting pain that lasts for a few seconds and disappears upon removal of the offending stimulus. For a small number of patients occasionally the pain may persist as a dull, throbbing ache that may last for a long period of time (2). A few theories has been proposed to explain the pain phenomenon of dentin hyper sensitivity, and at present the most widely accepted theory is the hydrodynamic theory proposed by Brann Strom and Astrom (3). Reported incidence of dentin hypersensitivity ranges from 3.8 to 57% of the population (4,5,6,7) The wide variation in the reported figures may be attributed to the differences in the research methodology. In general, most studies stated prevalence in the range of 15-20 % (5,7,8). It has been shown that the most commonly affected teeth were premolars and molars and the majority of suffers fall within the range of 20-40 years of age (4,5) . Treatment of dentin hypersensitivity has been largely aimed at either blocking the patient dentinal

tubules or modifying the pulpal nerve response. Agents containing active ingredients such as fluoride, Calcium hydroxide, oxalates, bioglass or tooth paste constituents such as silica abrasives have been used to occlude open dentinal tubules(9,10). In 2002, Kleinberg and co-workers reported on an innovative treatment modality for dentin hypersensitivity based upon 8% arginine, (an amino acid naturally present in saliva) (11). Several clinical studies have reported promising results with these products. In the studies by Schiff, et al and Hamlin, et al the arginine calcium carbonate desensitizing paste was compared to pumice based prophylaxis paste as a control, demonstrated that following the application of the past and four weeks later subjects exhibited statistically significant improvements in dentin hypersensitivity (12,13). Another study done by Docimo, et al in 2011 to evaluate the dentin hypersensitivity reduction efficacy on three commercially available tooth paste; Colgate sensitive pro-relief tooth paste (contain arginine – calcium carbonate) and Sensodyne rapid relief tooth paste and Crest cavity protection tooth paste and after four weeks of daily use of the products Colgate sensitive pro-relief tooth paste produced a significant

improvement in dentin hypersensitivity than other products(14) Another study by Hamlin et al in 2012 also found the same results after 8 weeks of treatment. Cummins 2010 found that this technology (Arginine – calcium carbonate) physically seals dentin tubules with a plug that contains arginine, calcium carbonate and phosphate which is resistant to normal pulpal pressures and to acid challenge and effectively reduces dentin fluid flow and thereby relieves sensitivity (15). Li et al in 2012, investigated the laboratory changes in dentin tubules occlusion morphology during short term use of the product as evaluated by electron microscopy and an image analysis. After application of the Colgate sensitive pro-relief tooth paste containing 8.0% arginine and calcium carbonate on dentin surface created a smear layer on dentin surface that significantly reduce the diameter of dentin tubules after treatment (16). The objective of this study was to evaluate the effect of long lasting self-applied Colgate sensitive pro-relief tooth paste in dentin hypersensitivity in group of Iraqi patients.

2. Material and Methods

The study was approved by the Human Research and Ethical Committee at the Faculty of Dentistry, Al- Mustansiriya University (Ethic no. 2/5/2012/69/422). This study was performed according to the international, national, and institutional rules on human care and techniques. Record were taken from 22/9/2012 till 25/1/2013 on 50 volunteered subject male and female with mean age between 20-40 years suffering from dentin hypersensitivity from at least two teeth on cold and hot stimuli and not due to dental caries .Subjects were required to be available for the study duration and to sign an informed consent form. To be eligible for participating in the study each subject had to have a minimum of two dentin hypersensitive teeth among incisors, canines and premolar with cervical erosion/abrasion or gingival recession. All subject on antibiotic treatment as mouth washes and subject with systemic disease and smokers and those using another desensitizing agent were excluded from the study. The exclusion was also applied to the following condition: current use of anticonvulsants, antihistamines, antidepressant, sedative, tranquilizers, anti inflammatory drugs, or daily analgesics; pregnant or lactating woman; participants in desensitizing dentifrices within the last three months; currently participating in another clinical study; history of allergy to oral care/personal care consumer products or the test product of the present study; or any existing medical condition that precluded them from not eating and drinking for a period of four hours. At home brushing instruction consisted of

brushing their teeth for one minute, twice daily using only the tooth paste provided and to refrain from any other oral hygiene products and procedures throughout the duration of the study. Assessment of the oral tissue and air blast dentin hypersensitivity were repeated by the same examiner using the same methods. For evaluating the air blast hypersensitivity, the tooth to be examined was isolated from the adjacent teeth (mesial and distal) by placing the examiner fingers over the adjacent teeth. Air was delivered from a standard dental unit air syringe at 60 psi (± 5) and 72F (± 3), directed at the exposed buccal, occlusal surface of the hypersensitive tooth for one second from a distance of approximately 1 cm (14). Record were taken according to Colgate sensitivity visual analog scale graduated from 0 to 10 that were explained to the subject and the severity of the stimuli determined the record according to the visual analog scale before and after using the Colgate sensitive pro-relief tooth paste. The mean air blast hypersensitivity scores were recorded before and after four weeks for each patient, evaluation carried out with the same visual scale. Only this tooth paste is used during the treatment and no other desensitizing tooth paste is used.

Data were analysed using the SPSS-20. Data were presented in simple measures of frequencies and percentages for study before and after treatment; and the values were expressed as: mean, mean difference, standard deviation, standard error. The significance of difference in means was tested by using: the paired sample T test, A P- Value of ≤ 0.05 was considered to be significant.

3. Results

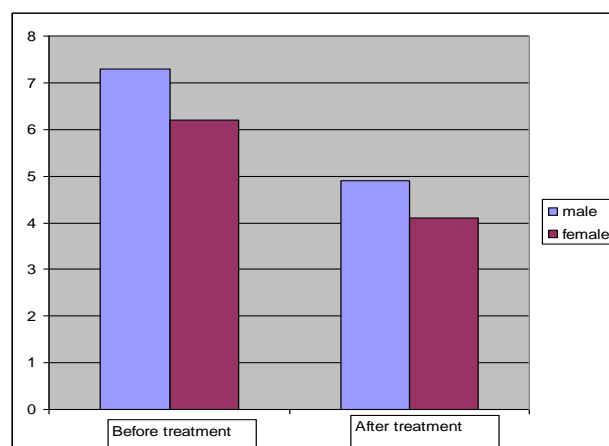


Figure 1: The Colgate sensitivity visual analog scale reading before and after using the Colgate sensitive pro-relief tooth paste for both male and female.

All 50 subjects completed the study. Table 1 shows: the mean age and gender distribution for both male and female. The average mean age for male was (33.1) and female was (32.4), the mean of reading before and after using the tooth paste for both male and female. The mean of reading for male and female before using the paste was (7.3) and (6.2) respectively and after using the paste was (4.9) and (4.1) respectively. The percentage of changes was

slightly higher in males (67.12%) than females (66.12%).

Statistical analysis of the total sample demonstrated a highly significant difference between before (32.8667 ± 1.53644) and after four weeks (4.8000 ± 0.44934) of twice daily use of the product ($p = 0.001$), this reflect that the use of product induce reduction in dentin hypersensitivity.

Table (1): The mean age, gender distribution, mean of reading before and after using the Colgate sensitive pro-relief tooth paste for both male and female.

Gender	No.	Mean age	Age Range	Analog scale Before treatment	Analog scale After treatment	Percent Change
Male	25	33.1	20-40	7.3	4.9	67.12%
Female	25	32.4	20-40	6.2	4.1	66.12%

Table (2): Mean and Standard Deviation before and after using tooth paste.

group	Number of patients	Mean \pm Std. Deviation	p
Before using Colgate sensitive pro-relief tooth paste	50	32.8667 ± 1.53644	0.001
After using Colgate sensitive pro-relief tooth paste	50	4.8000 ± 0.44934	

4. Discussions

Demands for the management of dentin hypersensitivity are expected to increase as the adult population lives longer and retains its teeth for life, and as populations of all age groups engage in lifestyles and behaviours that promote dentin exposure through gingival recession or erosion of protective tooth surfaces (17,18,19). Toothpastes have been widely used in the treatment of dentin hypersensitivity because of their low cost and ease of use for home application. Therapeutic management of dentin hypersensitivity may involve a combination of at-home and in-office treatments. Desensitizing dentifrices are the first-line treatment option that oral care professionals are likely to recommend, as well as the first remedy that dentin hypersensitivity sufferers are likely to self-prescribe.

Pro-Argin, a new technology based upon arginine and calcium carbonate, has been developed and validated for the treatment of dentin hypersensitivity (19). This technology can be delivered in the form of a dentifrice with fluoride for daily use, as well as a professionally applied desensitizing treatment. Moreover, it has been clinically proven that dentifrices with the Pro-Argin technology provide instant relief of dentin hypersensitivity when applied directly to each sensitive tooth and massaged for one minute, and the afforded relief is maintained with continued twice-daily brushing (20, 21,22,23,24). This clinical study

provided an investigative of the efficacy of the commercially available tooth paste Colgate sensitive pro-relief tooth paste with respect to dentin hypersensitivity reduction after four weeks of at-home brushing, two times per day over an four-week period in a selected Iraqi volunteer patients by using Colgate sensitivity visual analog scale graduated from 0 to 10. The Colgate Sensitive Pro-Relief Toothpaste, providing statistically significant improvements after four weeks of twice-daily brushing (32.8667 ± 1.53644 , 4.8000 ± 0.44934). This finding was in agreement with that reported by researcher in patients from Rome and Italy (25,26). Desensitizing dentifrices represent a treatment option that, given regimen compliance, may be efficacious for most individuals (2,12,13,42). The present study demonstrated that, males recorded relatively slight improvement than females 4.9, 4.1 (67.12% and 66.12%, respectively). These observations were in line with earlier researches (27, 28, 29, 30).In conclusion we suggest that, colgate sensitive pro-relief tooth paste contains 8% arginine and calcium carbonate used twice daily for four weeks significantly reduces dentin hypersensitivity. It offers significant relief of dentin hypersensitivity in Iraqi patients.

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