

COMPARISON OF GC TOOTH MOUSSE WITH FLUORIDE VARNISH TO TREAT DENTINAL HYPERSENSITIVITY

Bushra Irum¹, Anser Maxood², Javeria Ali Khan³, Rooshanay Haroon¹, Gul panrah Arbab¹, Khalid Rehman¹

¹ Department of Operative Dentistry, Khyber College of Dentistry, Peshawar

² Dental Department, Pakistan Institute of Medical Sciences, Islamabad

³ Department of Operative Dentistry, Dow University of Health Sciences, Karachi

ABSTRACT

Objective: To compare the effect of two desensitizing agents in treating dentinal hypersensitivity.

Materials and Methods: A Randomized clinical trial including 84 individuals aged 18 – 65 years was conducted. By flipping a coin, patients with hypersensitive lesions were split into two groups. Patients in Group A received Tooth mousse™, while patients in Group B received Dura shield™. Patients' pain responses to compressed air and tactile stimuli were measured using a visual analogue scale at baseline, one week, and 30 days following treatment. SPSS version 17 was used to analyze the data. The study was done at Department of Operative Dentistry, PIMS Islamabad from January 2011 to January 2012.

Results: A statistically significant difference existed between the two groups at seven days (p -value 0.008) with tactile stimulus and at thirty days (p -value 0.046) with air blast and (p value= 0.016) tactile stimulus after application with tooth mousse showing pain relief in more number of patients as compared to fluoride varnish group.

Conclusion: The comparison of two agents in this study showed that Tooth mousse™ showed better efficacy as compared to Dura shield™ in relieving dentinal hypersensitivity.

Keywords: Non-caries cervical lesions, hypersensitive teeth, desensitizing agents, Tooth mousse™, Dura shield™

INTRODUCTION

The loss of enamel or cementum causes exposure of dentinal tubules leading to a commonly reported clinical condition called dentinal hypersensitivity. As a result, the patients suffer from acute pain that is usually of short duration and it may be very uncomfortable for the patient. There are several stimuli that can cause pain, i.e. thermal, chemical, and mechanical, and the most common of these stimuli is cold stimulus.¹ The prevalence of dentinal hypersensitivity is 4- 57 % and individuals in their third decade of life most commonly suffer from it.²

Different predisposing factors responsible for causing dentinal hypersensitivity are abrasion, abfraction, erosion, gingival recession, buccal bone quality, periodontal disease and its treatment, restorative and surgical procedures, and patient destructive habits.³⁻⁷ The agents used for the treatment of DH are classified as anti-inflammatory agents, protein precipitants, tubule-occluding agents (potassium oxalate, calcium hydroxide, potassium nitrate, and sodium fluoride), tubule sealants (resins and adhesives), and lasers. However, unfortunately, none of these agents are capable of continuously delivering the medication for long periods of time therefore patients need to revisit dental offices seeking pain relief.⁸

Correspondence:

Dr. Bushra Irum

Assistant Professor, Khyber College of Dentistry, Peshawar

Email: bushrairum50@gmail.com

Contact: +923321506461

Casein, a milk protein, has recently been employed to create a remineralizing agent (GC Tooth

Mousse). The phosphoryl sequences of the casein phosphopeptide get attached and stabilized with amorphous calcium phosphatase. Dissolution of calcium and phosphate ions is prevented by casein phosphopeptide amorphous calcium phosphate maintaining a supersaturated solution of bio-available calcium and phosphates. Casein phosphopeptide amorphous calcium phosphate (CPP-ACP) has been shown in several studies to efficiently remineralize enamel subsurface lesions. It has also been suggested by the manufacturers that because of its remineralizing capacity, it can contribute in the prevention and treatment of DH.⁹ This study aimed to assess the effectiveness of recently introduced tooth mousse with more commonly used fluoride varnish for treating dentinal hypersensitivity. Tooth mousse can easily be applied at home by patients as compared to fluoride varnish that needs in office application, it also gives rapid relief from hypersensitivity and works well in presence of saliva.

MATERIALS AND METHODS

84 patients were selected from Dental OPD of Pakistan Institute of Medical Sciences Islamabad. The sample size was calculated using WHO calculator with level of significance 5 %. Informed consent of patients and approval from ethical committee was taken before starting the study.

Patients having minimum 02 teeth with buccal erosion, abrasion, abfraction or gingival recession (less than 5mm) that were hypersensitive to tactile and air blast stimuli having visual analog score > 30, were included in the study. The visual analog scale is a horizontal line, usually 100 cm in length. At the left end of the line is no pain while on the right side is extreme pain. The patient makes a mark on the line where they feel their current state is best represented. For the sake of convenience it is divided into, 0 – 30 = mild pain, 40 -60 = moderate pain, 70-100 = severe pain. Patients on Current desensitizing therapy and those taking anticonvulsants, sedatives, analgesics, antihistamines, anti-inflammatory or anti-hypertensive therapy, Pregnant patients, those having dental crowns, cracks, fractures, carious lesions, already restored teeth and root planning within last month were excluded from the study.

Consecutive (non-probability) sampling technique was used to select 84 (36 males and 48 females) otherwise healthy patients between age of 18 to 70

years.

A straight probe was used to evaluate each tooth for sensitivity by running it cervically. A dental unit air syringe was used to test the tooth response to cold air for 1-2 seconds. In group 1, after baseline assessment, the hypersensitive teeth were cleaned using distilled water soaked cotton pellet, and GC tooth mousse (Recaldent)TM was applied to the exposed surfaces of the selected teeth with a gloved finger. As per manufacturers recommendations there is no need for isolation as effect of tooth mousse is enhanced in presence of saliva. In group 2, same procedure was performed for fluoride varnish which was applied with help of disposable brush and cotton rolls. After the treatment, patients were told not to eat or drink for at least 30 minutes. The visual analog scale was recorded before application of the agents, after one week and then after one-month interval using tactile and air blast stimuli and recorded in the proforma.

SPSS version 17 was used for computation analysis of the data. Quantitative variables like gender and effectiveness of agents applied at one week and 30 days were presented as frequencies and percentages. Qualitative variables like age were presented as mean with standard deviation. Chi-square test was applied to determine the difference in effectiveness in two groups. P value < 0.05 was considered significant.

RESULTS

There were 36 (42.9%) males and 48 (57.1 %) females out of 84 patients in the study as shown in table 1. The mean age of group A (Toothmousse) was 36.83 ± 11.468 years and 41.17 ± 11.559 years for group B (Fluoride varnish) as shown in table II.

Baseline comparison of sensitivity between groups

At base line with p-value = 0.533, no significant difference was found in sensitivity between groups A and B with compressed air application. At baseline, statistically significant (p value = 0.048) difference between groups A and B in sensitivity with tactile stimulus was found. (Table III)

Comparison of sensitivity between groups after seven days

With air blast stimulus there was no statistically significant (p value 0.054) difference between the

two treatment groups seven days after application while with tactile stimulus there was a statistically significant (p value = 0.008) difference after application with tooth mousse group showing pain relief in more number of patients as compared to fluoride varnish as shown in table IV.

(p value=0.046) difference between the two treatment groups thirty days after application, with tooth mousse showing pain relief in more number of patients. Also there was a statistically significant (p value 0.016) difference between the two treatment groups thirty days after application, with tooth mousse showing pain relief in more number of patients with tactile stimulus. Table (V)

Comparison of sensitivity between groups after one month

With air blast stimulus there was a significant

Table 1: Means and Standard Deviations of Numerical Variables

Gender	Frequency	Percent	Cumulative Percent
Male	36	42.9	42.9
Female	48	57.1	100.0
Total	84	100.0	

Table 2: Age distribution in both the treatment groups

Groups/ Agents	N	Mean	St. deviation
Tooth mousse	42	36.83	11.468
Fluoride varnish	42	41.17	11.559

Table 3: Baseline comparison of sensitivity between groups with an air blast and tactile stimuli

Baseline sensitivity values	Air blast stimulus		Tactile stimulus	
	Tooth mousse	Fluoride varnish	Tooth mousse	Fluoride varnish
40 – 60 (moderate pain)	35	37	36	41
	83.3%	88.1%	85.7%	97.6%
70 – 100 (severe pain)	7	5	6	1
	16.7%	11.9%	14.3%	2.4%
Total	42	42	42	42
	100.0%	100.0%	100.0%	100.0%
P value	0.533		0.48	

Table 4: Comparison of sensitivity between groups after seven days with air blast and tactile stimuli

Pain relief after one week	Air blast stimulus		Tactile stimulus	
	Tooth mousse	Fluoride varnish	Tooth mousse	Fluoride varnish
0 (no pain)	3	1	3	1
	7.1%	2.4%	7.1%	2.4%
0- 30(mild pain)	26	16	28	16
	61.9%	38.1%	66.7%	38.1%
40- 60 (moderate pain)	13	24	11	25
	31.0%	57.1%	26.2%	59.5%
70- 100 (severe pain)	0	1		
	.0%		2.4%	
Total	42	42	42	42
	100.0%	100.0%	100.0%	100.0%
P-value	0.054		0.008	

Table 5: Comparison of sensitivity between groups after one month with air blast and tactile stimuli

Pain relief after 30 days	Air blast stimulus		Tactile stimulus	
	Tooth mousse	Fluoride varnish	Tooth mousse	Fluoride varnish
0 (no pain)	4	1	4	1
	9.5%	2.4%	9.5%	2.4%
0- 30(mild pain)	24	15	26	15
	57.1%	35.7%	61.9%	35.7%
40- 60 (moderate pain)	14	25	12	25
	33.3%	59.5%	28.6%	59.5%
70- 100 (severe pain)	0	1	0	1
	.0%	2.4%	.0%	2.4%
Total	42	42	42	42
	100.0%	100.0%	100.0%	100.0%
P-value	0.046		0.016	

DISCUSSION

In the present study, a short term comparison of tooth mousse™ and Dura shield™ was done for assessing effectiveness in alleviating the pain of dentinal hypersensitivity. Very few studies are available in literature that has compared the efficacy of fluoride varnish and CPP-ACP in reducing dentine hypersensitivity. Results of the current study show that there was more ratio of females reporting with dentinal hypersensitivity as compared to males, 48(57.1%) females and 36(42.9 %) males which is comparable with the results of the other studies.^{10,11}

Teeth most commonly affected by DH in this study were mandibular incisors, followed by pre molars and canines. It is in consistence with the study done by Pereira et al., in which a higher proportion of subjects (188 (36.9%) indicated their discomfort was in the lower anterior region followed by 161 (32%) of subjects indicating that their discomfort was in the lower left region.¹² In a study by Ahmed et al., most commonly affected teeth were shown to be premolars.¹³ This may be due to the difference in inclusion criteria of the study as it was done on noncarious cervical lesions only while our study included gum recession patients too. The most common sensitive teeth, according to Fischer et al were incisors and premolars (buccal surfaces).¹⁴

In the present study dentine hypersensitivity is more prevalent in age group of 36- 41 years and least above the age of 60. This particular age distribution, maybe because of more frequent and aggressive oral hygiene regimen adopted. The development of sec-

ondary or reparative dentine and subsequent sclerosis of the dentinal tubules may result in a decrease in DH in older patients. Mandke in an in vitro study done under scanning electron microscopy on teeth that were scheduled to be extracted concluded that there was a statistically significant increase (41.58%) in dentin microhardness, for in vivo samples after first day of CPP-ACP application as compared to sodium fluoride for which there was 10.92 % increase in dentin microhardness for in vivo samples after the first day of application. Thereby showing that CPP ACP has caused mineralization.¹⁵

By occluding dentinal tubules, CPP-ACP can help to reduce dentinal hypersensitivity. CPP-ACP cream was shown to be useful in treating dentin hypersensitivities in a systematic review, however there was inadequate evidence for its efficacy.¹⁶

To determine the effect of two desensitizing agents on the reduction of dentin hypersensitivity in a randomized, double-blind, split-mouth, controlled clinical trial, G.C. tooth mousse was found to be the most effective among the test groups (p<0.01). Tooth mousse’s effect was most effective in the first days of application, according to initial observations.¹⁷

In their clinical investigation, Kanaparthi and Aruna employed GC tooth mousse to treat dental hypersensitivity and compared it to a placebo.¹⁸ In the GC tooth mousse group, there were considerable pain decrease. Saraf et al. observed similar results in their research.¹⁹

The researchers concluded that two commercially available materials that contain CPP-ACP can

considerably lower dentinal tubule diameter when compared to a negative control in an in vitro scanning electron microscopy (SEM) investigation. As a result, these agents may be useful in the treatment of hypersensitivity of the teeth.²⁰

Hay and Thomson in 2002 concluded that CPP-ACP might be useful for caries prevention in dry mouth syndrome in a RCT (double-blinding unclear); small sample for 90 % power (type 2 error)no control over care outside study.²¹

Cai and colleagues in 2003 suggested that lozenges would be effective for delivering CPP-ACP to promote enamel remineralization (dose-related) in a double-blinded RCT with a crossover short washout sample size.²²

CONCLUSION

It was concluded in this study that Tooth mousse™ is more effective than Dura shield™ in relieving the pain of hypersensitivity at one week and one-month interval. Further studies are needed to be done to evaluate tooth mousse's long term or consistent effectiveness for relieving pain of dentinal hypersensitivity.

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