COMPARISON OF EFFECTIVENESS OF GC TOOTH MOUSSE WITH FLUORIDE VARNISH FOR TREATMENT OF DENTINAL HYPERSENSITIVITY

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ABSTRACT

Objective: *To compare the efficacy of two desensitizing agents in relieving dentinal hypersensitivity.*

Materials and Methods: *A Randomized clinical trial including 84 patients of age range between 18 – 65 years was carried out and patients having hypersensitive lesions were divided into two groups by the flip of coin. Tooth mousse TM was applied to patients in Group A and Dura shield TM to patients in group B. visual analog scale was used to assess patient's pain response to compressed air and tactile stimuli and recorded at baseline, one week and 30 days after application of agents. Data were analyzed using SPSS version 17. The study was done at Department of Operative Dentistry, PIMS Islamabad from January 2011 to January 2012.*

Results: *There was a statistically significant difference between the two treatment groups at seven days (p-value 0.008)with tactile stimulus and at thirty days (p-value 0.046) with air blast stimulus and (p value= 0.016) with 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 TM showed better results in relieving dentinal hypersensitivity than Dura shield™.*

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

INTRODUCTION

Dentinal hypersensitivity is a common clinical condition among patients caused by the loss of enamel or cementum that leads to exposure of dentinal tubules. 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 % to 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, quality of the buccal bone, periodontal disease and its treatment, surgical and restorative procedures, and patient destructive habits.[3,4,5,6,7] The most commonly used agents in 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. Various agents have been tried to eliminate this condition. However, none of these agents are capable of delivering the drug continually for long periods

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and requires revisits by patients for providing relief.[8]

Recently, milk protein casein has been used to develop a remineralizing agent (GC Tooth Mousse). The casein phosphopeptide contains phosphoryl sequences which get attached and stabilized with amorphous calcium phosphate. The casein phosphopeptide amorphous calcium phosphate (CPP-ACP) prevents the dissolution of calcium and phosphate ions and maintains a supersaturated solution of bioavailable calcium and phosphates. Various studies have shown that casein phosphopeptide amorphous calcium phosphate (CPP–ACP) can effectively remineralize enamel subsurface lesions. By its remineralizing capacity, it has also been proposed by the manufacturers that it can also help in 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 an in-office application, it also gives rapid relief from hypersensitivity and works well in presence of saliva.

MATERIALS AND METHODS

The study population consisted of 84 patients 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 marks on the line, the point that they feel represents their perception of current state. 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 antihypertensive 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.

Eighty-four otherwise healthy individuals (36 males and 48 females), aged 18 to 70 years were selected by consecutive (non-probability) sampling technique.

Sensitive teeth were identified with a straight probe run cervically evaluating each tooth. The tooth response to cold air was assessed using a standard air syringe of the dental unit for 1- 2 seconds. In group 01, after baseline assessment the hypersensitive teeth were cleaned with a cotton pellet soaked in distilled water, 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. Patients were instructed not to eat or drink for at least 30 minutes after the procedure. 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

Out of a total of 84 patients, there were 36 (42.9 %) males and 48 (57.1 %) females in the study as shown in table 1. The mean age of group A (Tooth mousse) 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

There was no significant difference between groups A and B in sensitivity with compressed air application at baseline with

P-value = 0.533 . There was statistically significant (p-value =0.048) difference between groups A

and B in sensitivity at baseline with tactile stimulus. (TableIII).

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.

Comparison of sensitivity between groups after one month

With air blast stimulus there was a significant (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)

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 sodium 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 consistent with the results of the other studies.[10]

Teeth most commonly affected by DH recorded in this study were lower incisors, followed by premolars and canines. It is in accordance 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.[11] In a study by Ahmed et al., most commonly affected teeth were shown to be premolars.[12] This may be due to the difference in inclusion criteria of the study as it was done on

Table 1: Gender distribution in treatment groups

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	Airblast stimulus		Tactile stimulus	
40 – 60 (moderate pain)	Tooth mousse	Fluoride varnish	Tooth mousse	Fluoride varnish
	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	Airblast stimulus		Tactile stimulus	
0 (no pain)	Tooth mousse	Fluoride varnish	Tooth mousse	Fluoride varnish
	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	Airblast stimulus		Tactile stimulus	
0 (no pain)	Tooth mousse	Fluoride varnish	Tooth mousse	Fluoride varnish
	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	

Noncarious cervical lesions only while our study included gum recession patients too. Fischer et al. demonstrated that incisors and premolars (buccal surfaces) were the most common sensitive teeth.[13]

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. A reduction of DH in seniors could be plausible due to the development of secondary or reparative dentine and subsequent sclerosis of the dentinal tubules accompanied by reduced sensitivity. 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.[14]

CPP–ACP is useful in reducing dentinal hypersensitivity by occluding dentinal tubules. CPP–ACP is proven to be effective in treating dentinal hypersensitivity . A systematic review found CPP–ACP cream to be effective in treating dentin hypersensitivity but found insufficient evidence for its efficacy.[15]

In a randomized, double-blind, split-mouth, controlled clinical trial to evaluate the effect of two desensitizing agents on the reduction of Dentin Hy-

persensitivity, G.C. tooth mousse was found to be the most effective among the test groups ($p<0.01$). The initial observation of this medicine revealed that its action was most effective in the first days of application.[16]

Kanaparthy and Aruna in their clinical study have used GC tooth mousse for the treatment of tooth hypersensitivity and compared it with placebo. The outcomes revealed significant reductions of pain in GC tooth mousse group.[17] Similar results were also found in a study by Saraf et al.[18]

In an in vitro scanning electron microscopic (SEM) study, the authors found that two commercially available materials which contain CPP-ACP can reduce dentinal tubules diameter significantly in comparison with a negative control. As a result, these agents may be helpful for the treatment of tooth hypersensitivity.[19]

Hay and Thomson in 2002, RCT (double-blinding unclear); small sample for 90 % power (type 2 error) no control over care outside study, concluded that CD-CP might be useful for caries prevention in dry mouth syndrome.[20]

Cai and colleagues in 2003 in a double-blinded RCT, crossover short washout sample size showed that lozenges might be suitable for delivery of CPP-ACP to promote enamel remineralization (dose-related).[21]

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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