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Comparative evaluation of two commercially available desensitising agents after scaling and root planing: an *in vivo* study

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Scaling and root planing has always been considered an indispensable procedure in periodontal disease management. As a result of instrumentation, dentinal tubules become exposed and sensitivity develops. Besides causing discomfort, the condition may deter a person from establishing or maintaining adequate oral hygiene procedures, further complicating oral health. Although materials have been tested to alleviate post-operative dentinal hypersensitivity, the issue has not been comprehensively addressed in the literature. Moreover, very few 'in office' topical medicaments available for dentine hypersensitivity meet the requirements of the ideal desensitising agent. In view of the ongoing search for an ideal desensitiser, this article evaluates the clinical efficacy of casein phosphopeptide amorphous calcium phosphate (CPP-ACP) and HEMA-G (aqueous solution of hydroxyethyl methacrylate and glutaraldehyde) desensitisers in managing dentine hypersensitivity following scaling and root planing.

Study design: Forty-eight patients undergoing periodontal treatment were included in the study. These patients presented with hypersensitivity following phase I therapy. After taking the baseline scores, agents were applied and reductions in post-operative dentine hypersensitivity were evaluated using the verbal rating scale at 0, 1, 4, 10 and 28 days. The results were analysed by percentage reduction in hypersensitivity and showed statistically significant differences between the control and treated teeth.

Results: Significant decreases were recorded for all the three test stimuli for group I (CPP-ACP) and group II (HEMA-G). Control group patients demonstrated a statistically non-significant ($P > 0.05$) decrease in mean discomfort score, observed from day 0 to day 4, which subsequently became significant on day 10. A highly significant ($P < 0.0001$) decrease was observed at day 28 for all the test stimuli, indicating that patients within the control group were also experiencing relief.

Conclusion: The study concluded that subgingival scaling and root planing followed by single application of CPP-ACP or HEMA-G provided higher short-term reductions in dentine hypersensitivity compared with controls.

■ Introduction

The term sensitive dentine or dentinal hypersensitivity refers to a clinical condition originating from exposure of the dentinal tissue and is characterised by a painful sensation after thermal, chemical, mechanical or osmotic stimuli. Clinically it is perceived as an acute, localised, rapidly developing and short-lived pain[1]. Exposure of dentine occurs from either the removal of the coronal enamel or a denudation of the root surface by loss of cementum and the overlying periodontal structures[2]. Following root planing, an increase in the number of open dentinal tubules arises. Moreover, the diameter of these open tubules is twice that of non-sensitive teeth; as a result, even with normal eating habits, sufficient thermal or osmotic stimuli occur to shift intratubular contents at a rate that causes mechanoreceptors to register pain.

A correlation between dentine hypersensitivity symptoms and periodontal treatment has been demonstrated by several authors[3]. Instrumentation of root surfaces, using curettes, and use of abrasives in periodontal therapy removes a thin layer of cementum (20 to 50 µm) and, thus, exposes dentinal tubules to the oral environment. These opened dentinal tubules are susceptible to ingress of bacteria and hydraulic changes in dentinal tubules due to temperature variation, leading to dentine sensitivity[4]. Dentine hypersensitivity persists until the formation of a smear layer or until natural occlusion of the dentinal tubules occurs.

Various theories have been provided to explain hypersensitivity, but the most accepted theory is hydrodynamic theory[5]. According to this theory, thermal, mechanical and osmotic stimuli act on the exposed dentinal surface leading to movement of intratubular fluid, causing deformation of mechanoreceptors and generating a neural response in pulp, which is experienced as pain by the patient. In light of the hydrodynamic theory, treatment of hypersensitive teeth should be directed towards reducing the functional diameter of the tubules so as to limit fluid movement[6,7]. Various 'in office' materials have been tested to manage hypersensitive dentine regardless of cause. Different agents have been used successfully in providing varying degrees of immediate and or long lasting relief from dentinal hypersensitivity.

In view of ongoing research to evaluate the newer therapeutic modalities for the management of this problem, the present study was designed to evaluate and compare two newer agents that claim efficacy in managing dentinal hypersensitivity: an aqueous solution of hydroxyethyl methacrylate and glutaraldehyde (HEMA-G) (Gluma Desensitizer®; Heraeus Kulzer, Dormoge, Germany) and casein phosphopeptide-amorphous calcium phosphate (CPP-ACP) (GC Tooth Mousse®, GC Corporation, Tokyo, Japan).

Gluma Desensitizer® is known to block the dentinal tubules by coagulation of dentinal fluid proteins within the dentinal tubules, thereby counteracting the hydrodynamic mechanism of dentinal hypersensitivity[8]. A newer product, CPP-ACP in topical paste form, has recently been introduced under the commercial name GC Tooth Mousse®. The manufacturers claim its efficacy in blocking patent dentinal tubules[9,10] and this study evaluates its clinical utility and performance.

■ Study design

A total of 48 patients suffering from sensitivity following scaling and root planing, of either sex, aged between 35 and 60 years, were selected from the out-patient department of periodontics of DAV (C) Dental College and Hospital, Yamuna Nagar, Haryana, India. The study was approved by the Institutional Review Board of Kurukshetra University (Affiliated with DAV (C) Dental College and Hospital) and all the participants signed informed consent forms.

Only patients suffering from chronic generalised periodontitis with pocket depths ≥ 5 mm, free from any systemic disease and willing to participate in the study were enrolled. Patients with any dental pathology causing pain similar to dentine hypersensitivity were excluded from the study.

A special form was designed to facilitate a systematic and methodical recording of all observations and information. This included a brief case history of the patient and clinical evaluation for hypersensitivity prior to and following treatment. Only patients who exhibited post-operative hypersensitivity following phase I therapy (scaling and root planing) to at least two test stimuli (tactile, air blast or a cold test stimulus) were enrolled in the study. After taking baseline scores, the agents were applied and evaluation of dentine hypersensitivity reduction was performed using a verbal rating scale (VRS) at 0, 1, 4, 10 and 28 days.

All patients enrolled for the study were instructed to use only non-fluoridated toothpaste, as fluorides have desensitising effects. Participants were instructed not to use any mouthwash during the course of the study.

The experiment model was a split mouth, double blind, randomised design. Dentine sensitivity was evaluated following scaling and root planing using a tactile test, air blast and cold-water test, and stimuli and baseline scores were recorded[11]. A sharp dental explorer (17/23) was passed lightly across the affected area of the tooth, perpendicular to the long axis of the tooth, to perform a tactile test[12]. The test was repeated three times before a score on the discomfort scale was recorded.

For the air blast test, air from a 3-in-1 dental air-water syringe (414 kPa) was directed onto the affected area of the tooth for 1 second from a distance of 10 mm (measured by taping a scale to the dental syringe); the adjacent teeth were protected using cotton rolls[5]. The score was recorded using the discomfort scale.

Freshly melted ice-cold water (melted for 1 to 2 minutes in a dappen dish) in a pre-cooled 1 ml disposable syringe was used to perform the cold water test[13]. After isolating the specific tooth, 0.2 ml of the ice-cold water was slowly ejected from the syringe onto the tooth surface.

For all the above stimuli, the subjects' response was recorded according to the following scale[14]:

0 = no significant discomfort or awareness of stimuli
1 = discomfort, but no severe pain
2 = severe pain during application of stimulus
3 = severe pain during and after application of stimulus.

After the tests were performed, the teeth that were rated 2 or more for any two of the tests were selected for the study. A total of 450 teeth were selected for the study, and randomly divided into three groups. The test sites were evenly distributed, with 150 teeth in each group.

Study groups

Group 1 comprised 150 teeth treated with CCP-ACP. The teeth to be treated with CCP-ACP (GC Tooth Mousse®) were cleaned with a cotton roll before a generous layer of paste was applied to the tooth surface using an application swab, gloved finger, or in difficult interproximal areas, using an interproximal tooth cleaning brush. The paste was left undisturbed for 5 minutes. The patient was asked to hold it in the mouth for as long as possible (1 to 2 minutes), avoiding expectoration, and to delay swallowing. The patient was advised not to eat or drink for at least 30 minutes following application.

Group 2 comprised 150 teeth treated with HEMA-G. The teeth to be treated with HEMA-G (Gluma Desensitizer®) were dried to remove any excess saliva from the tooth surface and then isolated using cotton rolls. A drop of HEMA-G was then applied with the help of a cotton applicator and left for 30 seconds. The surface was carefully dried with a stream of air until the fluid film had disappeared and the surface was no longer shiny. The patient was then asked to rinse thoroughly with water.

Group 3 comprised 150 teeth left untreated (controls). The teeth were left untreated after being checked for hypersensitivity following scaling and root planing. The patients were recalled and teeth were evaluated at days 1, 4, 10 and 28 following application. Among the home care measures, the subjects were instructed not to use any other desensitising agent during the course of the study. Throughout the study, stimuli were applied in the same order, i.e. tactile stimulus, an air blast and lastly cold water, and a minimum of 5 minutes was allowed between the applications of the different stimuli.

Results

The mean discomfort scores were recorded prior to topical treatment (baseline score), and after the application of desensitising agents (post-treatment) at day 1, 4, 10 and 28 (Fig 1). Scores showed varying decreases for each group.

Paired *t* test clearly showed a statistically significant ($P < 0.0001$) decrease in mean discomfort scores from baseline day (day 0) to various subsequent

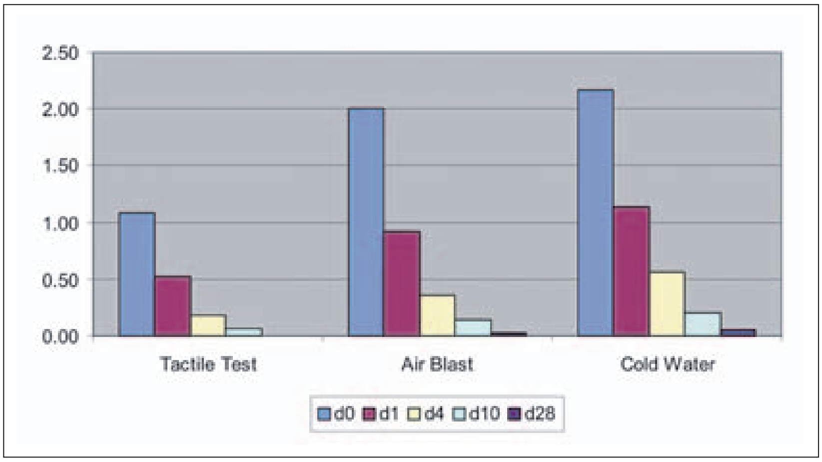

Fig 1a Mean discomfort scores at various recording days for group I patients.

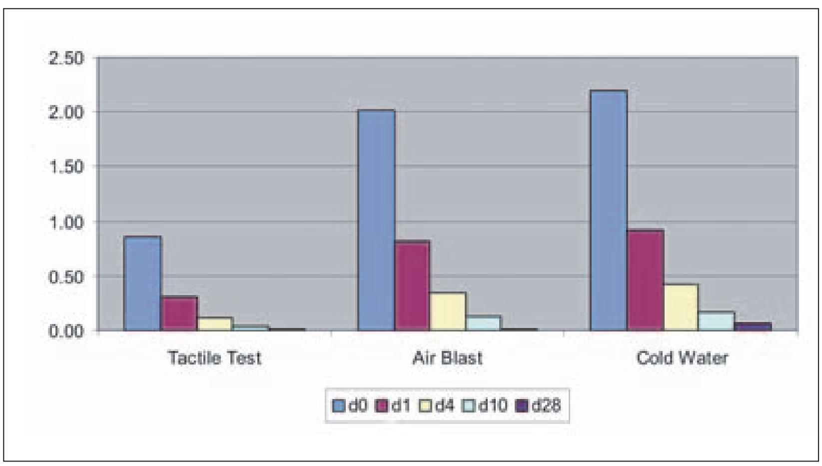

Fig 1b Mean discomfort scores at various recording days for group II patients.

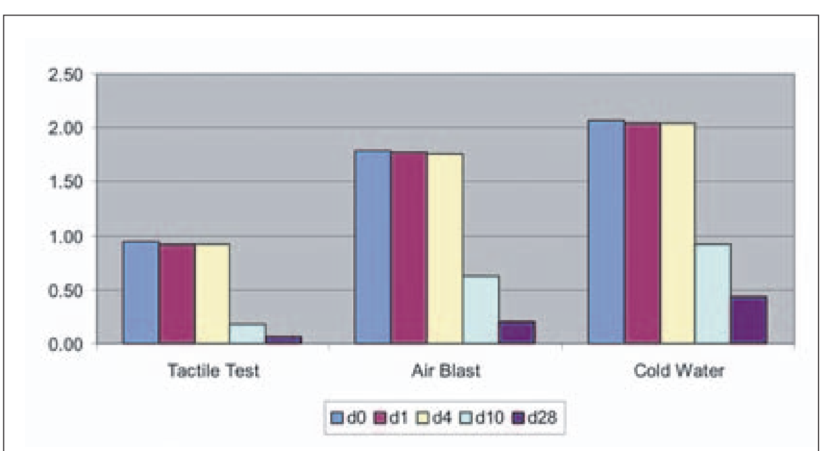

Fig 1c Mean discomfort scores at various recording days for group III patients.

recording days for all the three test stimuli for group 1 (CPP-ACP) and group 2 (HEMA-G) (Table 1).

When inter-group comparisons were made using unpaired *t* tests, highly significant differences ($P < 0.0001$) were observed at days 1, 4 and 10 for all the test stimuli used between group 1 and control, and group 2 and control. These differences became significant when CPP-ACP or HEMA-G were compared with controls for either of the stimuli on day 28 (Table 2).

Differences were not significant ($P > 0.05$) between groups 1 and 2 for all the recording day intervals when evaluated for tactile stimuli and the air blast stimulus. However, for the cold-water test a highly significant difference was observed when groups 1 and 2 were compared on day 1 and day 4 (Table 2).

In group 1 the percentage change for the tactile test from day 0 to day 1 was 51.85% and increased to 82.72% on day 4. For group 2 the percentage change recorded for the tactile test was marginally higher than group 1. Similarly for the air blast and cold-water tests, group 2 teeth showed a marginally higher percentage change from day 0 to 28. The percentage change between the mean discomfort score for all three groups for various test stimuli are detailed in Table 3. The percentage change for the controls (group 3) was minimal when compared with groups 1 and 2 until days 10 and 28.

The number of teeth and the frequency distribution among the various discomfort score categories at different time intervals is also shown in frequency tables by test type (Tables 4 to 6).

■ Discussion

Hypersensitivity following scaling and root planing remains a source of annoyance to both dentists and patients. The present study was planned to evaluate and compare two agents that claim improved efficacy in managing dentinal hypersensitivity (Gluma Desensitizer® and GC Tooth mousse®). All 48 patients completed the 28-day clinical study. All the selected teeth were subjected to three different test stimuli: tactile, air blast and cold-water tests. Chester et al[15] recommended that a minimum of two methods should be used to test products or clinical

Days	Tactile test			Air blast test			Cold-water test		
	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
0 vs. 1	-9.66**	-9.30**	-1.00ns	-20.57**	-17.95**	-1.41ns	-22.83**	-19.20**	-1.41ns
0 vs. 4	-11.26**	-12.83**	-1.34ns	-29.09**	-28.39**	-1.74ns	-32.33**	-28.75**	-1.74ns
0 vs. 10	-12.50**	-13.75**	-2.77*	-33.93**	-35.06**	-3.26*	-37.32**	-38.33**	-3.91*
0 vs. 28	-13.24**	-14.63**	-6.59**	-45.75**	-57.03**	-7.80**	-54.81**	-60.06**	-7.84**

$*P < 0.05$
$**P < 0.0001$
ns, not significant

Table 1 Significance values of mean discomfort scores from baseline to different time intervals for all groups (*t* values and significance).

Days	Tactile test			Air blast test			Cold-water test		
	Group 1 vs. 2	Group 1 vs. 3	Group 2 vs. 3	Group 1 vs. 2	Group 1 vs. 3	Group 2 vs. 3	Group 1 vs. 2	Group 1 vs. 3	Group 2 vs. 3
0	2.16ns	1.46ns	0.81ns	0.24ns	3.25ns	3.18ns	0.51ns	2.22ns	2.73ns
1	3.30ns	5.00**	8.71**	1.34ns	10.96**	12.02**	3.17**	15.09**	17.58**
4	1.61ns	10.55**	12.05**	0.19ns	18.38**	18.74**	2.04*	23.67**	26.37**
10	0.51ns	3.19**	3.61**	0.12ns	7.53**	7.67**	0.55ns	9.29**	10.00**
28	0.57ns	2.55*	2.18ns	0.82ns	4.10*	4.52*	0.24ns	7.20*	7.03*

$*P < 0.05$
$**P < 0.0001$
ns, not significant

Table 2 Comparison of mean discomfort scores at different time intervals between various groups for all the three test stimuli (*t* values and significance).

Days	Percentage change for tactile test (%)			Percentage change for air blast test (%)			Percentage change for cold-water test (%)		
	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
0 to 1	51.85	65.38	1.42	54.15	59.41	0.75	47.24	58.18	0.65
1 to 4	82.72	86.92	2.13	81.73	82.51	1.12	73.93	80.91	0.97
4 to 10	94.44	94.62	80.14	93.02	93.40	64.93	90.49	92.12	55.34
10 to 28	99.38	98.46	92.91	98.67	99.34	88.81	97.55	97.27	78.32

$*P < 0.05$
$**P < 0.0001$
ns, not significant

Table 3 Percentage change between the mean discomfort scores for various recording days for all the three groups for various test stimuli.

procedures *in vivo*, as sensitive teeth often respond to one type of stimulus and not to another. Pressure exerted by an explorer as the tactile stimulus is sufficient to overcome the elastic limit of dentine, leading to compression of the dentine, which presumably causes displacement of fluid inwardly to activate pulpal mechanoreceptors and elicit hypersensitivity[16]. The use of an air blast in testing for dentine sensitivity has been employed since Bräänström et al[5]. Cold water is an effective hydrodynamic stimulus due to the differences in thermal conductivity and coefficients of expansion or contraction of dentinal

Table 4a Frequency table showing sensitivity scores at various recording days for group 1 (CPP-ACP) when measured with the tactile test.

Score	Day 0 n (%)	Day 1 n (%)	Day 4 n (%)	Day 10 n (%)	Day 28 n (%)
0	47 (31.33)	86 (57.33)	124 (82.67)	141 (94.00)	14.9 (99.33)
1	51 (34.00)	50 (33.33)	24 (16.00)	9 (6.00)	1 (0.67)
2	45 (30.00)	14 (9.33)	2 (1.33)	0 (0.00)	0 (0.00)
3	7 (4.67	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)

Table 4b Frequency table showing sensitivity scores at various recording days for group 1 (CPP-ACP) when measured with the air blast test.

Score	Day 0 n (%)	Day 1 n (%)	Day 4 n (%)	Day 10 n (%)	Day 28 n (%)
0	1 (0.67)	36 (24)	104 (69.33)	135 (90.00)	146 (97.33)
1	9 (6.00)	90 (60.00)	37 (24.67)	9 (6.00)	4 (2.67)
2	128 (85.33)	24 (16.00)	9 (6.00)	6 (4.00)	0 (0.00)
3	12 (8.0)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)

Table 4c Frequency table showing sensitivity scores at various recording days for group 1 (CPP-ACP) when measured with cold-water test.

Score	Day 0 n (%)	Day 1 n (%)	Day 4 n (%)	Day 10 n (%)	Day 28 n (%)
0	0 (0.00%)	16 (10.67%)	76 (50.67%)	129 (86.00%)	142 (94.67%)
1	4 (2.67%)	96 (64.00%)	63 (42.00%)	11 (7.33%)	8 (5.33%)
2	116 (77.33%)	38 (25.33%)	11 (7.33%)	10 (6.67%)	0 (0.00%)
3	30 (20.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)

fluids and dentine. It causes a more rapid volumetric contraction of dentinal fluid than dentine. This mismatch of volumetric changes produces negative intrapulpal and presumably intradental pressures that displace mechanoreceptors and cause pain[16]. The order of application of stimulus is also important. Therefore, in the present study a tactile stimulus (the least disturbing stimulus) was used first, followed by an air blast and then cold water, with a 5-minute gap between these test stimuli[17]. It could be argued that a limitation of this study was that there was a lack of randomisation of the three stimuli to each of the test groups.

A verbal rating scale was used as the criteria for sensitivity assessment, and employs subjective criteria[14,18].

The days of evaluation (1, 4, 10 and 28) were selected to test the immediate and longer-term effects of agents in the study. Furthermore, Bergenholtz and Lindhe[19] have shown that the peak of dentinal hypersensitivity occurs within 1 week of periodontal instrumentation and reduces thereafter[20].

CPP-ACP, when evaluated by paired student *t* test, showed a significant decrease in discomfort scores from day 0 to subsequent recording days for all the three test stimuli. GC Tooth Mousse® is a water-based cream containing CPP-ACP. The paste, upon application at day 0 after scaling and root planing, may form a bond with the biofilm, the hydroxyapatite of the tooth, and/or the soft tissues, thus helping to localise the bioavailable calcium and phosphate ions. These act by maintaining a state of supersaturation within the oral environment. The supersaturated state with respect to Ca^{2+} and PO_4^{3-} ions may facilitate the formation of intratubular crystals, thus occluding patent dentinal tubules and reducing hypersensitivity. The effects of Ca^{2+} and

Score	Day 0 n (%)	Day 1 n (%)	Day 4 n (%)	Day 10 n (%)	Day 28 n (%)
0	58 (38.67)	106 (70.67)	135 (90.00)	143 (95.33)	148 (98.67)
1	56 (37.33)	43 (28.67)	13 (8.67)	7 (4.67)	2 (1.33)
2	34 (22.67)	1 (0.67)	2 (1.33)	0 (0.00)	0 (0.00)
3	2 (1.33)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)

Table 5a Frequency table showing sensitivity scores at various recording days for group 2 (Gluma Desensitiser®) when measured with the tactile test.

Score	Day 0 n (%)	Day 1 n (%)	Day 4 n (%)	Day 10 n (%)	Day 28 n (%)
0	2 (1.33)	48 (32.00)	105 (70.00)	136 (90.67)	148 (98.67)
1	14 (9.33)	81 (54.00)	37 (24.67)	8 (5.33)	2 (1.33)
2	113 (75.33)	21 (14.00)	8 (5.33)	6 (4.00)	0 (0.00)
3	21 (14.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)

Table 5b Frequency table showing sensitivity scores at various recording days for group 2 (Gluma Desensitiser®) when measured with the air blast test.

Score	Day 0 n (%)	Day 1 n (%)	Day 4 n (%)	Day 10 n (%)	Day 28 n (%)
0	0 (0.00)	38 (25.33)	97 (64.67)	132 (88.00)	141 (94.00)
1	3 (2.00)	86 (57.33)	43 (28.67)	10 (6.67)	9 (6.00)
2	114 (76.00)	26 (17.33)	10 (6.67)	8 (5.33)	0 (0.00)
3	33 (22.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)

Table 5c Frequency table showing sensitivity scores at various recording days for group 2 (Gluma Desensitiser®) when measured with the cold-water test.

PO_4^{3-} ions on the remineralisation of enamel have been studied by Reynolds[9,10,21], but in the present case these ions might have blocked the open tubules by the formation of intratubular crystals, consistent with the proceedings of the first world conference on dental and pulpal pain, where intratubular crystal formation from various ions was suggested as a method to counter dentinal hypersensitivity[6,22].

In the case of Gluma, the mean discomfort score decreased when teeth were tested for any of the stimuli. Paired student *t* test analysis confirmed that this decrease in mean discomfort score from baseline to subsequent recording days for all the three test stimuli was statistically significant. These observations indicate the potential of Gluma as a desensitising agent. The desensitising effect of Gluma has been attributed to the ability of glutaraldehyde to cause protein precipitation into the dentinal tubules, thereby occluding the tubules[6]. On evaluation, groups 1 and 2 showed a highly significant decrease in discomfort scores from baseline to subsequent recording day intervals. Interestingly, group 3 patients also demonstrated a reduction in the discomfort scores from day 0 to 28 for all the three test stimuli. Although the comparisons among the mean discomfort scores showed no significant change between baseline (day 0) and days 1 and 4, for group 3 patients, significant differences were noted on days 10 and 28. These findings are consistent with those of Pillon et al[20].

The control group differences recorded at days 10 and 28 may have been due to auto-occlusion of the patent dentinal tubules by either the formation of intratubular crystals from dentinal fluid or invasion of tubules by bacteria. Formation of intratubular collagen plugs and leakage of large plasma proteins up into tubules have also been suggested[22]. This block-

Table 6a Frequency table showing sensitivity scores at various recording days for group 3 (control) when measured with the tactile test.

Score	Day 0 n (%)	Day 1 n (%)	Day 4 n (%)	Day 10 n (%)	Day 28 n (%)
0	47 (31.33)	47 (31.33)	47 (31.33)	124 (82.67)	141 (94)
1	65 (43.33)	67 (44.67)	68 (45.33)	24 (16.00)	8 (5.33)
2	38 (25.33)	36 (24.00)	35 (23.33)	2 (1.33)	1 (0.67)
3	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)

Table 6b Frequency table showing sensitivity scores at various recording days for group 3 (control) when measured with the air blast test.

Score	Day 0 n (%)	Day 1 n (%)	Day 4 n (%)	Day 10 n (%)	Day 28 n (%)
0	10 (6.67)	10 (6.67)	10 (6.67)	70 (46.67)	126 (84.00)
1	28 (18.67)	29 (19.33)	30 (20.00)	66 (44.00)	18 (12.00)
2	96 (64.00)	96 (64.00)	95 (63.33)	14 (9.33)	6 (4.00)
3	16 (10.67)	15 (10.00)	15 (10.00)	0 (0.00)	0 (0.00)

Table 6c Frequency table showing sensitivity scores at various recording days for group 3 (control) when measured with the cold-water test.

Score	Day 0 n (%)	Day 1 n (%)	Day 4 n (%)	Day 10 n (%)	Day 28 n (%)
0	1 (0.67)	1 (0.67)	1 (0.67)	50 (33.33)	94 (62.67)
1	7 (4.67)	8 (5.33)	8 (5.33)	62 (41.33)	45 (30.00)
2	124 (82.67)	124 (82.67)	125 (83.33)	38 (25.33)	11 (7.33)
3	18 (12.00)	17 (11.33)	16 (10.67)	0 (0.00)	0 (0.00)

age of patent dentine may lower the hydraulic conductance of the exposed dentine, below the levels that permit activation of nerve endings. When intergroup comparisons were made for the discomfort scores at day 0, no significant differences were found between the three test stimuli, indicating that the patients selected for the study were balanced by randomisation. Further, although the mean discomfort scores exhibited a decrease from day 0 to 28 for all the three groups when tested with either of the three test stimuli, subanalysis demonstrated significant inter-group differences between Gluma and controls and CPP-ACP and controls at days 1, 4 and 10. This further helps to explain the potential effects of HEMA-G and CPP-ACP in providing relief to the hypersensitive teeth immediately after scaling and root planing. The reduction in discomfort scores observed in the control group may imply an immediate benefit from the two test agents. However, the significance at day 28 between groups 1 and 2 and groups 2 and 3 signifies that patients treated with either of the tested agents appear to have benefited over control group patients.

Furthermore, though no significant differences were found between HEMA-G and CPP-ACP for tactile and air blast tests, significant differences were observed between the two groups (1 and 2) at days 1 and 4 for the cold-water test. However, this was not significant at days 10 and 28. This shows that HEMA-G and CPP-ACP appeared comparable in providing relief from hypersensitive teeth when tactile and air blast stimuli were used. HEMA-G appeared more effective in providing immediate relief against the cold-water stimulus when applied after scaling and root planing. The comparison of percentage change in the mean discomfort scores from day 0 to 1 and subsequent recording days between group 1 and group 2 demonstrated a slightly higher value for the patients treated with HEMA-G until days 1 and 4 for all the three test stimuli. Furthermore, the percentage change was found to be comparable at days 10 and 28 (between groups 1 and 2) for all the three tests.

■ Conclusions

It may be concluded that a single application of HEMA-G or CPP-ACP following subgingival scaling and root planing provided a significantly higher reduction of dentine hypersensitivity compared with controls. The study also demonstrated that HEMA-G and CPP-ACP were comparable in providing relief from hypersensitive teeth to tactile and air blast stimuli, but HEMA-G appeared more effective in providing immediate relief to cold-water stimuli when applied after scaling and root planing.

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