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Original Research

Assessment of efficacy of CPP-ACP F, sodium fluoride, propolis, and placebo in treating patients with Dentinal hypersensitivity

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ABSTRACT:
Background: Dentin hypersensitivity (DH) is characterized by an acute and short-term pain, arising from vital dentin exposed to the oral medium, in response to thermal, evaporative, tactile, osmotic, or chemical stimulation. Three topical desensitizers were employed in this study CPP- ACPF, sodium fluoride, propolis, and placebo as a control group for the treatment of dentinal hypersensitivity. **Aim of the study:** To assess efficacy of CPP-ACP F, sodium fluoride, propolis, and placebo in treating patients with Dentinal hypersensitivity. **Materials and methods:** A total of 40 subjects in general health were selected. The patients were given a visual analogue scale upon which they were asked to place a mark at a point on a linear scale marked from 0–10 cm to describe the pain experienced. Patients were randomly grouped into 4 groups with 10 subjects in each group, Group 1 (CPP-ACP F), Group 2 (Sodium fluoride), and Group 3 (Propolis) and control group (Group 4). Each group was treated using one of the four desensitizing products in accordance with the manufacturer's instructions. The desensitizing agents were applied and rubbed over the tooth surface and left undisturbed for 60 s. **Results:** We observed that in all the groups the mean sensitivity score drastically dropped from baseline to 60th day. The efficacy of all the desensitizers was comparable. **Conclusion**: Within the limitations of the present study, it can be concluded that efficacy of CPP-ACP F, sodium fluoride and propolis in treating patients with Dentinal hypersensitivity is very effective. The results for all the groups were significant.
Keywords: Dentinal hypersensitivity, CPP-ACP F, densitizers

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INTRODUCTION:
Dentin hypersensitivity (DH) is characterized by an acute and short-term pain, arising from vital dentin exposed to the oral medium, in response to thermal, evaporative, tactile, osmotic, or chemical stimulation. [1, 2] Brännström's hydrodynamic theory reports that DH pain is generated when the stimulus application, over the exposed dentin, changes the dentinal tubules fluid's histophysiology. This rapid movement excites A-β and A-δ nerve fibers from the pulp's periphery and transmits a signal that is perceived as pain.[3, 4] Most of published information relates to the prevalence of hypersensitivity; however, currently there does not appear to be globally agreed Gold standard procedure for comparative purposes in clinical trial setting for evaluation of new desensitizing agents. [5, 6] Three topical desensitizers were employed in this study CPP- ACPF, sodium fluoride, propolis, and placebo as a control group for the treatment of dentinal hypersensitivity. Only a few studies have evaluated the efficiency of desensitizing agents in vivo. Hence, the present study was conducted to assess efficacy of CPP-ACP F,

sodium fluoride, propolis, and placebo in treating patients with Dentinal hypersensitivity.

MATERIALS AND METHODS:

The present study was conducted for assessing the efficacy of CPP-ACP F, sodium fluoride, propolis, and placebo in treating patients with Dentinal hypersensitivity. The ethical clearance for the study was approved from the ethical committee of the hospital. For the study, a total of 40 subjects in general health were selected. An informed written consent was obtained from each of the subject after verbally explaining them the protocol of the study. At the first screening visit, demographic details were obtained together with medical and dental histories. Sensitivity was assessed by means of tactile and evaporative stimuli. The patients were given a visual analogue scale upon which they were asked to place a mark at a point on a linear scale marked from 0–10 cm to describe the pain experienced. Patients were randomly grouped into 4 groups with 10 subjects in each group, Group 1 (CPP-ACP F), Group 2 (Sodium fluoride), and Group 3 (Propolis) and control group (Group 4). Each group was treated using one of the four desensitizing products in accordance with the manufacturer's instructions. The desensitizing agents were applied and rubbed over the tooth surface and left undisturbed for 60 s. The patients were then asked not to rinse, eat, or drink for 30 min after the treatment. Pre- and post-treatment assessment was done at the baseline, 15th day, 28th day and 60th day.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student's t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

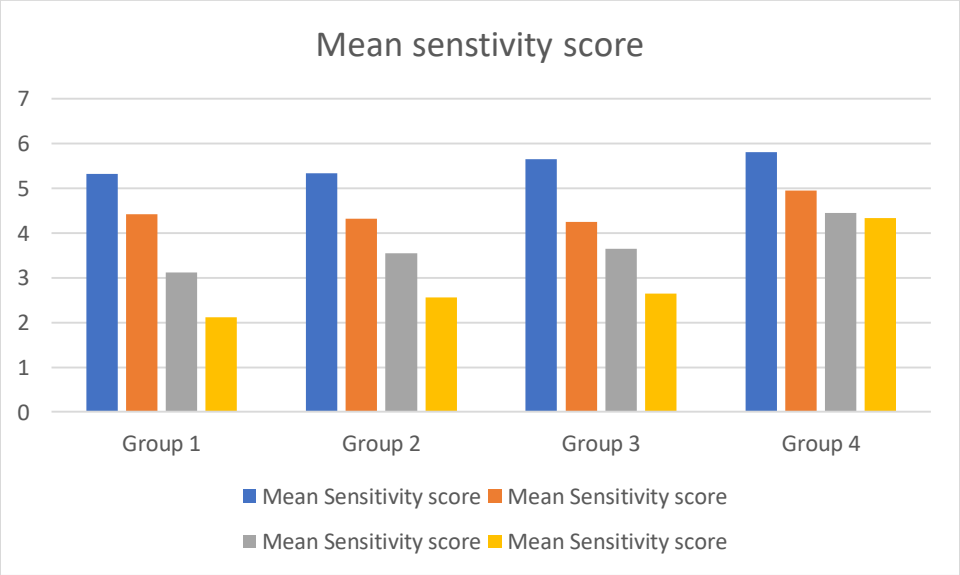
RESULTS:

In the present study, we selected a total of 40 healthy subjects to evaluate 4 different desensitizers Table 1 shows the comparative analysis of mean sensitivity score of different desensitizers. We observed that in all the groups the mean sensitivity score drastically dropped from baseline to 60th day. The efficacy of all the desensitizers was comparable. The results on comparison were found to be statistically significant. ($p<0.05$). [Fig 1]

Table 1: Comparative analysis of mean sensitivity score of different sensitizers

Groups	Mean Sensitivity score			
	At baseline	On 15th day	On 28th day	On 60th day
Group 1	5.32	4.42	3.12	2.12
Group 2	5.33	4.32	3.55	2.56
Group 3	5.65	4.25	3.65	2.65
Group 4	5.8	4.95	4.45	4.33

Fig 1: Comparative analysis of mean sensitivity score of different sensitizers



DISCUSSION:

In the present study, we observed that mean sensitivity score for all the groups reduced significantly over time with least sensitivity score noted at 60th day. The results on comparison were seen to be statistically significant. The results were compared to previous studies in the literature and were consistent with the results. Madhavan S et al evaluated and compared the clinical efficiency of CPP-ACP F, sodium fluoride, propolis, and distilled water that was used as placebo in treating dentinal hypersensitivity. 120 patients aged 20–40 years reporting with dentinal hypersensitivity in relation to canine, premolar and molars with erosion, abrasion, and gingival recession were randomly assigned to four groups of 30 patients each. Response to air jet and tactile stimuli were measured using visual analogue scale initially on 1st, 7th, 15th, 28th, 60th, and final assessment was done on the 90th day. The teeth treated with the test group showed decrease in the mean hypersensitivity values compared to control group, over a period of three months. The results showed propolis to be most efficient in treating dentinal hypersensitivity and CPP- ACPF showed to be the least efficient. They concluded that all test groups were effective in reducing dentinal hypersensitivity, although they differed in rapidity of action over the period of 3 months. Hongal S et al evaluated the ability of 30% ethanolic extract of Indian propolis on dentinal tubule occlusion comparatively against CPP-ACP containing desensitizing agent GC tooth mousse. The specimens were prepared from 30 freshly extracted sound human third molars stored in 10% formalin (pH 7.0) at a room temperature. From each specimen, a sectioned sample was obtained including the cervical area. Samples were smoothened and wet-polished with 1000- and 1200-grit aluminum oxide abrasive paper and diamond pastes, in order to stimulate the clinical aspect of hypersensitive dentin cervical surfaces. All the specimens were randomly assigned to three groups, according to dentin surface treatments. Negative control: Untreated specimens and pretreated with 6% citric acid; Test Group: 30% ethanolic extract of Indian propolis; Positive Group: GC Tooth Mousse. All the specimens were prepared for SEM analysis. GC tooth mousse promoted tubule occlusion by crystal-like deposits in the lumen of the tubules. While propolis created a thin, smooth layer over dentin surface. They concluded that both desensitizing agent were able to occlude the dentinal tubules. [7, 8]

Guanipa Ortiz MI et al evaluated the effect of the casein phosphopeptide-amorphous calcium phosphate fluoride (CPP-ACPF) and photobiomodulation (PBM) in the treatment of dentin hypersensitivity (DH), and the impact of this on the health-related quality of life (HRQL). Eighty teeth with DH were randomized into four groups and received three treatment sessions: PLACEBO = placebo + LASER application mimicking; CPP-ACPF = CPP-ACPF + LASER application mimicking; PBM = placebo + LASER active application; CPP-ACPF+PBM = CPP-ACPF + LASER active application. Tactile (exploratory probe) and evaporative (triple syringe) stimuli were used to measure DH and were recorded with the aid of a visual analogue scale (VAS) after the 1st, 2nd and 3rd treatment sessions and one-month follow-up. The HRQL was recorded in the DH experience questionnaire (DHEQ). The intragroup comparison showed a significant reduction in DH with both stimuli after one-month follow-up. The intergroup comparison with the evaporative stimulus showed that CPP-ACPF+PBM significantly reduced DH when compared to the rest of treatments, after one-month follow-up. CPP-ACPF+PBM group statistically differed from the other treatment groups in the DHEQ evaluation after one-month follow-up. After one-month follow-up, they concluded that the association of CPP-ACPF with PBM was effective in the reduction of DH and promoted a positive impact on the HRQL of the participants of this study. Sharma H et al evaluated the efficacy of MI varnish and Clinpro XT varnish in reducing dentinal hypersensitivity. Materials and Methods:Patients with cervical dentinal hypersensitivity were selected for the study. The teeth to be tested were isolated. Then, a blast of air and ice cold water was applied on the tooth surface, and the score was measured by visual analog scale. The patients were randomly assigned to one of the treatment groups (Group 1: MI varnish; Group 2; Clinpro XT varnish). The manufacturer's instructions were followed. The sensitivity scores were recorded immediately and after 1 week of therapy. Statistical Analysis:Mann-Whitney U-test and Wilcoxon-matched pairs test were used for the analysis. Results and Conclusion:Although both varnishes were shown to reduce the dentinal hypersensitivity in patients, according to statistics, MI Varnish was a better agent to reduce dentinal hypersensitivity than Clinpro XT varnish. [9, 10]

CONCLUSION:

Within the limitations of the present study, it can be concluded that efficacy of CPP-ACP F, sodium fluoride and propolis in treating patients with Dentinal hypersensitivity is very effective. The results for all the groups were significant.

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