

Efficacy of Milk as a Desensitizing Agent for the Treatment of Sensitivity Following Scaling and Root Planing

Abstract

Background: Dentine hypersensitivity (DH) is the most common problem encountered by most of the dentists in their day-to-day clinical practice. It is characterized by a sharp pain or discomfort arising as a response to thermal, chemical, or osmotic stimuli and is caused due to exposure of dentine after the enamel or cementum at the root surface has been lost by the treatment, underlying dental and gingival diseases or physiologic wear and tear of the teeth. This further complicates preventive oral hygiene procedures by the patients, which jeopardize periodontal treatment or may as well aid in periodontal treatment failure. **Aim and Objective:** To evaluate the efficacy of commercially available milk as a desensitizing agent for the treatment of sensitivity following scaling and root planing. **Materials and Methods:** Patients were selected randomly for scaling and then assessed for sensitivity. Those patients having DH were divided into two groups, wherein the Group A (test) patients were advised to rinse with commercially available milk at room temperature and those in Group B (control) with a commercially available mouthwash (Sentosil-SF). A four-point verbal rating scale was designed to record the numerical value of DH and were recalled for follow-up on 4th, 7th, and 10th day posttreatment. **Results:** The study demonstrated that there was a considerable reduction in hypersensitivity in both the groups on the 7th and 10th day. In the milk group, eight patients showed a complete reduction in hypersensitivity on 7th day and 13 patients on 10th day, while in the mouthwash group, five patients showed the same on 7th day and ten patients on the 10th day, thus suggesting that more individuals in the milk group were benefited. However, there was no statistically significant difference between the groups in every visit. **Conclusion:** Although there is a vast literature available which suggests the efficacy of commercially available mouthwash in reducing hypersensitivity, this study is the first of its kind which evaluates the efficacy of commercially available milk in reducing sensitivity which is induced postscaling. Considering that milk rinse is cheap and easily available at home, it can be used as a desensitizing agent, and rinsing with milk for few days is effective and stable in quick reduction of hypersensitivity induced by scaling.

Keywords: Dentine hypersensitivity, milk, root planing, scaling, sensitive teeth

Introduction

Dentine hypersensitivity (DH), which is described as an exaggerated response of exposed dentine to application of a stimulus, is one of the most common clinical problems faced by the clinicians in day-to-day dental practice.^[1] This condition is also termed as cervical dentine sensitivity (DS), cervical DH, DS, root DS, or root sensitivity. It is observed that most of the patients complain of DH following periodontal treatment, which further prevents them from maintaining a good oral hygiene.^[2] Most of the studies state that individuals with periodontal disease have higher prevalence of DH after periodontal treatment, especially

scaling and root planing.^[2-4] Although the intensity of sensitivity decreases thereafter, the associated pain and discomfort caused by DH may refrain the patient from maintaining a good oral hygiene, further complicating the oral health. There are different treatment modalities available to treat DH, but none of them provides a definite conclusion as to which treatment is superior. With the development of various desensitizing agents, the milk protein casein has also been used as a remineralizing agent aiding in the prevention and treatment of DH.^[5] Although there are a few studies establishing the desensitizing therapeutic benefit of milk rinse following the nonsurgical periodontal treatment, there are no comparable studies available for

Jyosthna G. Madhurkar, Pragathi R. Bhat, Anirudh B. Acharya, Srinath L. Thakur, Vijay A. Trasad

Department of Periodontics, SDM College of Dental Sciences and Hospital, Dharwad, Karnataka, India

Address for correspondence:

Dr. Pragathi R. Bhat, Department of Periodontics, SDM College of Dental Sciences and Hospital, Sattur, Dharwad - 580 009, Karnataka, India. E-mail: bhat.pragathi3@gmail.com

Access this article online

Website:
www.contempclindent.org

DOI: 10.4103/ccd.ccd_73_17

Quick Response Code:



How to cite this article: Madhurkar JG, Bhat PR, Acharya AB, Thakur SL, Trasad VA. Efficacy of milk as a desensitizing agent for the treatment of sensitivity following scaling and root planing. Contemp Clin Dent 2017;8:231-5.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

milk rinse in the treatment of DH. Thus, considering the novelty of milk protein casein – this is a first of its kind of a study with an objective to evaluate the efficacy of commercially available milk as a desensitizing agent for the treatment of sensitivity following scaling and root planing.

Materials and Methods

The present study was conducted in the Department of Periodontics, SDM College of Dental Sciences and Hospital, Dharwad, from January 30, 2016, to July 30, 2016. Fifty systemically healthy individuals with the diagnosis of moderate to severe chronic periodontitis indicated for scaling and root planing were selected randomly for the study by a periodontist. Patients with unrestored carious lesions, cervical abrasions, impacted teeth with pain; patients on medications such as anti-inflammatory, antibiotics, immunosuppressant, or oral contraceptive drugs; pregnant and lactating mothers; smokers; or patients with systemic diseases and conditions, currently on desensitizing therapy, or had received professionally applied desensitizing treatment during 6 months before the study or had undergone periodontal treatment in the last 6-month period were excluded from the study. After obtaining written informed consent, the patients were assessed for baseline DH scores by tactile perception using an Explorer (No. 17–23). If the sensitivity did persist, the patients were included in the study. All the subjects presented a score of 4 at baseline. To avoid bias, the study investigator assessed the baseline DH postscaling and divided the patients randomly into Group A (test) and Group B (control). The coinvestigator was blinded and assessed the sensitivity on 4th, 7th, and 10th day. Thus, in this single-blinded study, fifty patients were divided into two groups, namely, Groups A and B by the study investigator, comprising 25 participants in each group. The participants in Group A were advised to rinse the oral cavity with 30 ml commercially available cow milk (Nandini) at room temperature five times daily for 5 min for 10 days, and participants in Group B were advised to rinse with a desensitizing mouthwash (Sentosil-SF) 10 ml twice daily for 10 days. Sensitivity was assessed, wherein patients in both the groups were recalled for check-up on 4th, 7th, and 10th day posttreatment. The coinvestigator was blinded and was trained to assess sensitivity so as to avoid bias. Sensitivity was assessed by tactile perception with an Explorer (No. 17–23) along with a 4-point verbal rating

scale,^[1] which is a clinical scale to find out the numerical values of the clinical problem of DH and is described as follows: Score 1 - No hypersensitivity – No discomfort to thermal changes after drinking water at room temperature or cold water; Score 2 - Mild hypersensitivity – Mild discomfort after drinking water at room temperature and cold water; Score 3 - Moderate hypersensitivity – Moderate discomfort after drinking water at room temperature but cannot drink cold water; and Score 4 - Severe hypersensitivity – Pain after drinking water at room temperature, pain on breathing, cannot tolerate cold water (severe pain). The participants in both the groups were instructed not to eat/drink for 30 min after rinse and not to use any other desensitizing agents and/or pain killers. The results were subjected to statistical analysis so as to evaluate the effectiveness of milk as a desensitizing agent for the treatment of sensitivity following scaling and root planing.

Statistical analysis

The results were tabulated and analyzed using Chi-square test for Group A and Group B patients so as to compare and evaluate the efficacy of milk and Sentosil-SF mouthwash for the treatment of hypersensitivity following scaling procedure.

Results

In the milk group, [Table 1] in the first visit (day 2), three individuals (12%) had score 4 (severe hypersensitivity), twenty individuals (80%) had score 3 (moderate sensitivity), and two individuals (2%) has score 2 (mild sensitivity). In the second visit (day 4), none of the individuals had score 4 (severe hypersensitivity), while eight individuals (32%) had score 3 (moderate sensitivity), 15 individuals (60%) has score 2 (mild sensitivity), and two individuals (8%) had score 1, thus indicating that there was an improvement in the scores of sensitivity from day 2 to day 4. While in the third visit (7th day), none of the individuals showed severe hypersensitivity, only one individual (4%) had score 3 (moderate sensitivity), 16 individuals (64%) had score 2 (mild sensitivity), and eight individuals (32%) had score 1 (no sensitivity), thus demonstrating that in the milk group, there was a considerable reduction in the hypersensitivity during the third visit (7th day) when compared to first visit (2nd day). However, in the fourth visit (10th day), none of the

Table 1: Reduction in hypersensitivity on various occasions in the milk group

Milk group (n=25)	Score 4 (severe hypersensitivity)		Score 3 (moderate hypersensitivity)		Score 2 (mild hypersensitivity)		Score 1 (no hypersensitivity)	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Visit 1 (2 nd day)	3	12	20	80	2	8	0	0
Visit 2 (4 th day)	0	0	8	32	15	60	2	8
Visit 3 (7 th day)	0	0	1	4	16	64	8	32
Visit 4 (10 th day)	0	0	0	0	12	48	13	52

individuals had severe or moderate hypersensitivity, while 12 individuals (48%) had score 2 (mild sensitivity), and 13 individuals (52%) had score 1 (no sensitivity). This conveyed that there was a considerable reduction of hypersensitivity in the milk group on 7th and 10th day.

In the mouthwash group (Sentosil-SF), [Table 2] in the first visit (day 2), 6 individuals (24%) had score 4 (severe hypersensitivity), 19 individuals (76%) had score 3 (moderate sensitivity), and none of the individuals had score 2 (moderate) and score 1 (mild sensitivity). In the second visit (day 4), none of the individuals had score 4 (severe hypersensitivity), while nine individuals (36%) had score 3 (moderate sensitivity), 16 individuals (64%) has score 2 (mild sensitivity), while none of the individuals had score 1 (no sensitivity), thus indicating that there was an improvement in the scores of sensitivity from day 2 to day 4. While in the third visit (7th day), none of the individuals showed severe and moderate hypersensitivity, twenty individuals (80%) had score 2 (mild sensitivity), and five individuals (20%) had score 1 (no sensitivity), thus demonstrating that in the milk group, there was a considerable reduction in the hypersensitivity during the third visit (7th day) when compared to first visit (2nd day).

However, in the fourth visit (10th day), none of the individuals had severe or moderate hypersensitivity, while twenty individuals (80%) had score 2 (mild sensitivity), and ten individuals (40%) had score 1 (no sensitivity). This conveyed that there was a considerable reduction of hypersensitivity in the mouthwash group also on 7th and 10th day. It was as well observed that there was no statistically significant difference in the reduction of hypersensitivity during each visit in both the groups and there was a considerable reduction in hypersensitivity in both the groups on 7th (visit 3) and 10th day (visit 4) [Tables 3-6].

Discussion

DH is one of the most common clinical problems faced by the clinicians in their everyday dental practice, which is caused due to the exposure of the dentine after the enamel or cementum at the root surface is lost due to the periodontal treatment.^[1] Dentine is a living tissue consisting of organic, inorganic components and dentinal tubules running from the pulp to the outer dentinal surface. According to the most accepted Brannstrom’s hydrodynamic theory of DH, the fluid displacement within the dentinal tubules stimulates

Table 2: Reduction in hypersensitivity on various occasions in the mouthwash group

Sentosil-SF group (n=25)	Score 4 (severe hypersensitivity)		Score 3 (moderate hypersensitivity)		Score 2 (mild hypersensitivity)		Score 1 (no hypersensitivity)	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Visit 1 (2 nd day)	6	24	19	76	0	0	0	0
Visit 2 (4 th day)	0	0	9	36	16	64	0	0
Visit 3 (7 th day)	0	0	0	0	20	80	5	20
Visit 4 (10 th day)	0	0	0	0	15	60	10	40

Table 3: Comparison of reduction in hypersensitivity in both the groups during the first visit

Visit 1 (2 nd day)	Score 4 (severe hypersensitivity)		Score 3 (moderate hypersensitivity)		Score 2 (mild hypersensitivity)		Score 1 (no hypersensitivity)		P
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	
Milk group (n=25)	3	12	20	80	2	8	0	0	0.2
Sentosil-SF group (n=25)	6	24	19	76	0	0	0	0	

Table 4: Comparison of reduction in hypersensitivity in both the groups during the second visit

Visit 2 (4 th day)	Score 4 (severe hypersensitivity)		Score 3 (moderate hypersensitivity)		Score 2 (mild hypersensitivity)		Score 1 (no hypersensitivity)		P
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	
Milk group (n=25)	0	0	8	32	15	60	2	8	0.3
Sentosil-SF group (n=25)	0	0	9	36	16	64	0	0	

Table 5: Comparison of reduction in hypersensitivity in both the groups during the third visit

Visit 3 (7 th day)	Score 4 (severe hypersensitivity)		Score 3 (moderate hypersensitivity)		Score 2 (mild hypersensitivity)		Score 1 (no hypersensitivity)		P
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	
Milk group (n=25)	0	0	1	4	16	64	8	32	0.3
Sentosil-SF group (n=25)	0	0	0	0	20	80	5	20	

Table 6: Comparison of reduction in hypersensitivity in both the groups during the fourth visit

Visit 4 (10 th day)	Score 4 (severe hypersensitivity)		Score 3 (moderate hypersensitivity)		Score 2 (mild hypersensitivity)		Score 1 (no hypersensitivity)		P
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	
	Milk group (n=25)	0	0	0	0	12	48	13	
Sentosil-SF group (n=25)	0	0	0	0	15	60	10	40	

the A-delta fibers resulting in the well localized sharp pain which is perceived as DH.^[3,6]

There are two phases proposed in the pathogenesis of DH, namely, lesion initiation and lesion localization.^[7] Lesion initiation occurs after the protective covering of the smear layer is removed, which may occur during scaling and root planing, thus leading to the exposure and opening of the dentinal tubules, which culminates in the lesion localization and DH. Lesion localization is the loss of protective covering over the dentine such as loss of enamel through attrition, abrasion, erosion, or abfraction and gingival recession.^[2,7] Although there are many treatment modalities for the treatment of DH, none provides definite conclusion and is considered as a gold standard for the treatment of DH. Moreover, studies by Gillam and Orchardson^[8] and Chabanski and Gillam (1997)^[9] have reported the higher prevalence of sensitivity following scaling and root planing. Tammaro *et al.*^[10] concluded that successful supportive periodontal therapy cannot be accomplished with unwanted side effects such as gingival recession and DH. Recently, milk protein casein has been developed as a remineralizing agent named GC Tooth Mousse (Recaldent, GC Corporation, Japan). However, study conducted by Lata *et al.*^[11] concluded that amorphous (CCP-ACP) GC Tooth Mousse, Recaldent, GC Corporation, Japan, in cream form is less effective than fluoride varnish for enamel subsurface remineralization, while study conducted by Vashisht *et al.*^[12] concluded that amorphous (CCP-ACP) has a significant potential to remineralize the early enamel lesions. Similarly, a study conducted by Sabir and Alam^[2] concluded that casein in milk helps remineralize the early enamel lesions, thus reducing DH following periodontal treatment procedures. Thus, this study evaluated and compared the effectiveness of milk rinse and mouthwash (Sentosil-SF) as a desensitizing agent for DH induced postscaling. Although the results showed no statistically significant difference in the reduction of hypersensitivity in the milk as well as the mouthwash group on all the four visits, it was observed that there was a considerable reduction in hypersensitivity on 7th day (visit 3) and 10th day (visit 4) in both the groups. However, it is evident from this study that on day 2, of the 25 individuals, only 2 individuals (8%) had mild hypersensitivity and none others reported of no hypersensitivity, while on day 10, it was observed that 12 individuals (48%) had moderate and 13 individuals (52%) had no hypersensitivity. Thus, the results of this study suggested strongly positive results for the treatment of hypersensitivity with milk rinse. This could be attributed

to the fact that milk protein casein phosphor-peptide (CPP) contains phosphoserine sequences which by attaching with the amorphous calcium phosphate (ACP) of teeth forms stabilized CPP-ACP, which prevents the dissolution of calcium and phosphate ions and maintains a supersaturated enamel lesions, thus treating the DH.^[2,5]

The results from the study by Sabir and Alam^[2] proposed that rinsing with milk may provide rich bioavailability of calcium and phosphates which aid in remineralization of the open dentinal tubules, thus reducing the DH.

Thus, the present study establishes the desensitizing therapeutic benefit of milk rinse for the treatment of sensitivity following scaling. However, further such comparable studies can be conducted with large sample size.

Conclusion

This study clearly establishes the mechanism of milk rinse as a desensitizing therapeutic agent in the treatment of DH. Thus, within the limitations of this study, it can be concluded that milk is also effective in reducing sensitivity after scaling. Milk rinse is easily available, cheap, and an effective home use substitute for the treatment of sensitivity induced by scaling.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Addy M. Etiology and clinical implications of dentine hypersensitivity. *Dent Clin North Am* 1990;34:503-14.
2. Sabir M, Alam MN. Milk as desensitizing agent for treatment of dentine hypersensitivity following periodontal treatment procedures. *J Clin Diagn Res* 2015;9:ZC22-5.
3. von Troil B, Needleman I, Sanz M. A systematic review of the prevalence of root sensitivity following periodontal therapy. *J Clin Periodontol* 2002;29 Suppl 3:173-7.
4. Lin YH, Gillam DG. The prevalence of root sensitivity following periodontal therapy: A systematic review. *Int J Dent* 2012;2012:407023.
5. Miglani S, Aggarwal V, Ahuja B. Dentin hypersensitivity: Recent trends in management. *J Conserv Dent* 2010;13:218-24.
6. Burwell A, Jennings D, Muscile D, Greenspan DC. NovaMin and dentin hypersensitivity – *In vitro* evidence of efficacy. *J Clin Dent* 2010;21:66-71.
7. Orchardson R, Gillam DG. Managing dentin hypersensitivity.

- J Am Dent Assoc 2006;137:990-8.
8. Gillam DG, Orchardson R. Advances in the treatment of root dentine sensitivity: Mechanisms and treatment principles. *Endod Topics* 2006;13:13-33.
 9. Chabanski MB, Gillam DG. Aetiology, prevalence and clinical features of cervical dentine sensitivity. *J Oral Rehabil* 1997;24:15-9.
 10. Tamaro S, Wennström JL, Bergenholtz G. Root-dentin sensitivity following non-surgical periodontal treatment. *J Clin Periodontol* 2000;27:690-7.
 11. Lata S, Varghese NO, Varughese JM. Remineralization potential of fluoride and amorphous calcium phosphate-casein phosphopeptide on enamel lesions: An *in vitro* comparative evaluation. *J Conserv Dent* 2010;13:42-6.
 12. Vashisht R, Kumar A, Indira R, Srinivasan MR, Ramachandran S. Remineralization of early enamel lesions using casein phosphopeptide amorphous calcium Phosphate: An *ex-vivo* study. *Contemp Clin Dent* 2010;1:210-3.