

## An Epidemiological Survey on Dental Hypersensitivity Correlated with use of Different Tooth Pastes

Raksha Potdar<sup>1</sup>, Amitha Ramesh<sup>2</sup>, Pavithra J<sup>3</sup>, Biju Thomas<sup>4</sup>, Neevan DR Dsouza<sup>5</sup>, Rahul Bhandary<sup>6</sup>

1. PG, Department of Periodontics, ABSMIDS, NITTE Deemed to be university, Mangalore, India.
2. Professor, Department of Periodontics, ABSMIDS, NITTE Deemed to be university, Mangalore, India.
3. PG, Department of Periodontics, ABSMIDS, NITTE Deemed to be university, Mangalore, India.
4. Professor, Department of Periodontics, ABSMIDS, NITTE Deemed to be university, Mangalore, India.
5. Biostatistics, Department of Periodontics, KSHEDGE, Medical College.
6. Professor, Department of Periodontics, ABSMIDS, NITTE Deemed to be university, Mangalore, India.

### Abstract

**Introduction:** Toothpaste is a paste or gel dentifrice used with a toothbrush to clean and maintain the aesthetics and health of gingiva and teeth. It serves as an abrasive that aids in removing dental plaque and food from the teeth. In the last decade, many consumers have switched over to herbal toothpastes in order to avoid synthetic and artificial flavors commonly found in regular toothpastes. **Aim:** To check the correlation of dental hypersensitivity with herbal and non-herbal toothpastes. **Methods:** The study population of survey consisted of n=83 patients 25-65 years visiting the outpatient, Department of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences. Self-administered questionnaire elicited information on systemic and oral health status, type of toothpaste used, duration of use, brushing habits and presence of dentinal hypersensitivity. **Results:** A total of n=83 patients were investigated, out of which 44.5% used herbal toothpaste while the rest used non-herbal toothpaste. The prevalence of dentinal hypersensitivity was n=22 (26.5%) among the participants and there was no significant correlation found between the herbal toothpaste and dentinal hypersensitivity ( $p = 0.272$ ). There is no significant difference in usage of herbal toothpaste and non-herbal toothpaste and their duration of use with dentinal sensitivity ( $p = 0.4380$ ). There is no significant difference between dentinal hypersensitivity and brushing techniques. ( $p = 0.546$ ). **Conclusion:** The prevalence of dentinal hypersensitivity was low. This shows that the use of herbal/non-herbal toothpaste does not have significant effect on dental hypersensitivity. It can be concluded that herbal toothpastes and dental hypersensitivity are not correlated.

**Keywords:** Herbal, toothpaste, dentinal hypersensitivity, tooth brushing techniques

**Address for correspondence:** Dr. Raksha Potdar, I MDS, Department of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences, Nitte deemed to be University, Mangaluru-575018 Phone numbers: 9741974280 E-mail address: [raksha.potdar@gmail.com](mailto:raksha.potdar@gmail.com)

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### Introduction

A paste or gel dentifrice which is used in adjunct with a toothbrush to clean and maintain the oral hygiene, aesthetics and health of gingiva and teeth is called a toothpaste. It acts like an abrasive that helps in removing dental plaque and food from the teeth. Various

toothpastes are available in the market. In the last decade, a large population in order to avoid synthetic and artificial flavors commonly found in regular toothpastes has switched over to herbal toothpastes.

Dentinal hypersensitivity is a significant dental health problem, characterized by short, sharp, pain arising from exposed dentine in response to stimuli typically thermal, evaporative, tactile,

osmotic, or chemical which cannot be ascribed to any other form of dental defect or pathology.<sup>[1-3]</sup> Dentinal hypersensitivity being an episodic pain condition, is likely to become a more frequent dental complaint in the future due to the increase in longevity of the dentition and the rise in tooth wear<sup>[4]</sup>. Dentinal hypersensitivity has multiple causative factors. It is seen to be more common with increase in age due to increased wear of tooth surface, improper brushing techniques, and use of abrasive toothpastes. Thus the aim of this study is to check the association of dentinal hypersensitivity with herbal toothpaste and their duration of use and its association with toothbrushing techniques.

## Materials and Methods

A questionnaire-based survey conducted for a period of 3 months from August 2019 to October 2019 in the Department of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences. The sample was selected by simple random stratified technique. The study population consisted of n=83 patients. Informed verbal consent was obtained from all the patients. The patients willing to participate in

the survey with minimum twenty complement of teeth between the age group of 25 – 65 years were included in the survey. Patients who had undergone oral prophylaxis in the past six months, pregnant and lactating mothers and patients with debilitating diseases were excluded from participating in the survey.

### Data Collection

All the patients were provided with questionnaire forms and asked to mark their answers. The oral health and systemic health of all the patients were recorded. The type of toothpaste used (herbal/ non-herbal) and duration of use was recorded. History of sensitivity of teeth before and after usage of toothpaste was collected. The data was collected and statistically analyzed using SPSS software version 22. The questionnaire was designed to collect information regarding dentinal hypersensitivity and its correlation to the type of toothpaste used.

### Sample Size Calculation

Based on 5 percent level of significance and estimated proportion of people having sensitivity 31 percent, estimation error 10 percent sample size required is 83.

### Sample questionnaire

<b>NAME:</b>		<b>7) Which toothpaste do you use?</b>	
<b>AGE/SEX:</b>		a) Colgate                      b) Patanjali	
<b>ADDRESS:</b>		c) Dabur                      d) Meswak                      e) Any Other	
<b>PHONE NUMBER:</b>		<b>8) How long have you been using this toothpaste?</b>	
<b>OCCUPATION:</b>		a) For the last month      b) For the last 6months	
<b>1) Do you brush your teeth?</b>		c) For the last year        d) More than a year	
a) Yes                      b) No		<b>9) Who recommended the toothpaste?</b>	
<b>2) How often do you brush your teeth?</b>		a) Doctor                      b) Family/friends	
a) Not at all              b) Once a day		c) Self                          d) Others	
b) Twice a day          d) More than two times		<b>10) Do you have any systemic disease?</b>	
<b>3) Which brushing technique do you use?</b>		a) Yes                          b) No	
a) Vertical                  b) horizontal		<b>11) Do you experience sensitivity of teeth?</b>	
b) Circular                d) Any other		a) Yes                          b) No	
<b>4) Which brush do you use?</b>		<b>If yes did you start experiencing sensitivity after starting the use of the herbal toothpaste?</b>	
a) Hard                      b) Medium		a) Yes                          b) No	
b) Soft                      d) Super soft		<b>12) Any other adverse effects after using the herbal toothpaste?</b>	
<b>5) Do you use toothpaste while brushing?</b>		a) Yes                          b) No	
a) Yes                      b) No		If yes then specify -	
<b>6) Do you use herbal toothpaste?</b>			
a) Yes                      b) No			

### Statistical Analysis

The data collected was analyzed using SPSS software version 22. Frequencies were used to document qualitative variables studied to test the association between herbal toothpaste and dental hypersensitivity. Chi square test was carried out,  $p < 0.05$  was considered to be statistically significant.

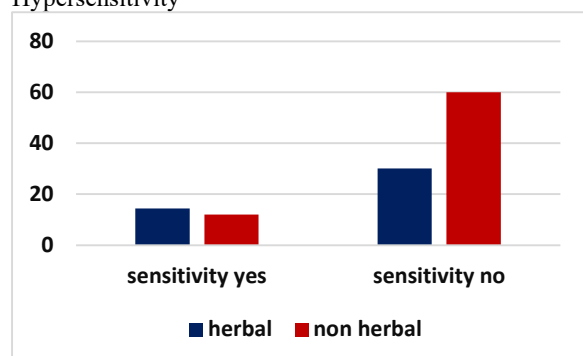
## Results

A total of  $n=83$  patients were included in the survey. The data was collected and the following observations were analyzed.

**Table 1:** Association of use of Toothpaste and Dental Hypersensitivity

Type of Toothpaste	Sensitivity		Total
	Yes	No	
Herbal	12 (14.4%)	25 (30.1%)	37 (44.5%)
Non-Herbal	10 (12%)	36 (43.3%)	46 (55.4%)
Total	22 (26.5%)	61 (73.4%)	83 (100%)

**Chart 1:** Association of use of Toothpaste and Dental Hypersensitivity



The number of individuals in herbal and non-herbal toothpaste group as seen in table 1 were 37  $n=$  and  $n=46$  respectively. The prevalence of dental hypersensitivity was  $n=22$  (26.5%) among the study population. Out of the  $n=22$  participants who reported with dental hypersensitivity  $n=12$  (14.4%) used herbal toothpaste and  $n=10$  (12%) used non-herbal toothpaste. There is no significant difference in usage of herbal toothpaste with dental hypersensitivity. ( $p = 0.272$  refer Table No.1).

**Table 2:** Association of dental hypersensitivity and type of toothpaste and duration of use

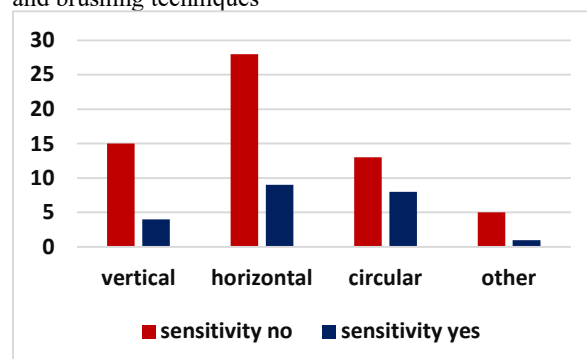
Type of Toothpaste	Duration of Use		
	<6 Months	One Year	>One Year
Non Herbal	9	3	13
Herbal	7	1	4

There is no significant difference in usage of herbal toothpaste and non-herbal toothpaste and their duration of use with dental sensitivity ( $p = 0.4380$  refer table no.2).

**Table 3:** Association between dental hypersensitivity and brushing techniques

Dental Hypersensitivity	Vertical	Horizontal	Circular	Other
Sensitivity No	15	28	13	5
Sensitivity Yes	4	9	8	1

**Chart 2:** Association between dental hypersensitivity and brushing techniques



There is no significant difference between dental hypersensitivity and brushing techniques. ( $p = 0.546$ , refer table 3).

## Discussion

Dental hypersensitivity is a common dental condition with prevalence as high as 74%, standing it out, as one of the most painful conditions affecting oral comfort and function. According to a randomized control trial conducted by M Kumari et al; herbal toothpaste group at the end of 6-12 weeks showed great reduction in dental hypersensitivity.<sup>[5]</sup> Hence a novel herbal toothpaste can be recommended to treat dental hypersensitivity.<sup>[5]</sup> In a study conducted by Rola Al Habashneh et al; there is no decrease in dental hypersensitivity in Colgate total as compared to Colgate herbal toothpaste.<sup>[6]</sup> According to a study conducted by Disha Bansalet al; Novamin containing toothpaste showed better reduction in dental hypersensitivity as compared to arginine containing toothpaste and herbal desensitizing toothpaste. The present study showed an increased prevalence of dental hypersensitivity in the herbal toothpaste group as compared to the non-herbal group. However, the study did not reveal a significant correlation

between use of herbal toothpaste and dentinal hypersensitivity. It was also found that there is no significant association between the type of toothpaste and the duration of its use on dentinal hypersensitivity.

Since a long time incorrect tooth brushing techniques have been said to play a role in the etiology of abrasive tooth wear [7-9]. Multiple studies have shown an increase in cervical abrasive lesions in patients who brush their teeth more often and for a longer duration. Use a scrubbing tooth brushing technique has also been proved to be more damaging.<sup>[10]</sup> The present study showed an increase prevalence of dentinal hypersensitivity in individuals who used horizontal brushing technique as compared to other techniques, but it was not statistically significant.

### Limitations

This was only a questionnaire-based survey; no clinical assessment of the oral cavity was performed. More studies in a larger population have to be performed to gain information about the prevalence of dentinal hypersensitivity.

## Conclusion

In the present study it was found that there is no association between the types of toothpaste, duration on the dentinal hypersensitivity experienced by patients. Based on the observations of the current survey higher number of people in the herbal group had dentinal hypersensitivity, but statistically it was not significant.

**Conflict of Interest:** None declared

**Source of Support:** Nil

**Ethical Permission:** Obtained

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