

Assessment of Prevalence of Dentin Hypersensitivity in the General Populations: A Hospital Based Study

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ABSTRACT

Background: To study the prevalence of dentine hypersensitivity and related risk factors in attending the O.P.D. of Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India.

Materials and Methods: A total of 650 subjects reporting dentine sensitivity were included in the study comprising of 290 males and 360 females. All the subjects completed an interview and the subjects reporting dentine hypersensitivity were examined further using air syringe to put a blast of air to confirm the diagnosis of dentine hypersensitivity. Periodontal attachment loss and gingival recession of all the sensitive teeth were examined and recorded.

Results: The prevalence of dentine hypersensitivity was 26% in the oral test. The subjects receiving the treatment of hypersensitivity were only 14.7%. The older group in the 55–72 years had the highest number (98%) of subjects with dentine hypersensitivity. Most commonly affected teeth were mandibular incisors. The other factors related to dentine hypersensitivity were the socioeconomic status, lower education level, and access to dental care. The periodontal factors related to hypersensitivity were gingival recession and poor oral hygiene.

Conclusions: The prevalence of dentine hypersensitivity was 26% in Anugrah Narayan Magadh Medical College and Hospital which serving the large population of Bihar and Jharkhand.

Keywords: Adult population, dentine hypersensitivity, oral test.

INTRODUCTION

Dentine sensitivity (DS) or dentinal hypersensitivity (DH) is one of the most commonly encountered clinical problems. It is clinically described as an exaggerated response to application of a stimulus to exposed dentine, regardless of its location.[1,2] The terms DS or DH have been used interchangeably to describe the same clinical condition. True hypersensitivity can develop due to pulpal inflammation and can present the clinical features of irreversible pulpitis, i.e., severe and persistent pain, as compared with typical short sharp pain of

DH.[3] Majority of literature reviews dealing with this clinical condition have suggested the use of term DS and consider that the sharp pain is actually the normal pulpal response to the exposed dentine.[4,5] But it is well known that all exposed dentine are not sensitive and the term DH has been used over the decades by the clinicians.[6,7] Therefore, both the terminologies can be used to describe the clinical condition. The condition has been defined by an international workshop on DH as follows:[8] "Dentine hypersensitivity is

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characterized by short, sharp pain arising from exposed dentine in response to stimuli, typically thermal, evaporative, tactile, osmotic or chemical and which cannot be described to any other dental defect or pathology". Some authors have substituted the word "dentine" and added the site, such as cervical or root, resulting in various other terminologies (e.g., cervical sensitivity/hypersensitivity) to describe the same clinical condition. [9]

PREVALENCE AND EPIDEMIOLOGY

DH is a painful clinical condition with an incidence ranging from 4 to 74%. [10-14] The variations in the reports may be because of difference in populations and different methods of investigations. The methods employed are usually patient questionnaires or clinical examinations. Interestingly, the incidence of DH is much higher in patient questionnaires studies than in clinical studies which quote an incidence of 15%. [11, 12]

A slightly higher incidence of DH is reported in females than in males. While DH can affect the patient of any age, most affected patients are in the age group of 20-50 years, with a peak between 30 and 40 years of age. [11] Regarding the type of teeth involved, canines and premolars of both the arches are the most affected teeth. Buccal aspect of cervical area is the commonly affected site. [15]

Therefore, the extent of this problem in the rural population of India is not known. The purpose of this study was to cross-sectional study of the general population who attending the O.P.D. of Anugrah Narayan Magadh Medical College and Hospital, Gaya. The sample was random and dentine sensitivity after treatment and scaling was also noted.

MATERIALS AND METHODS

The sample was taken from O.P.D. Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India serving the large population of Bihar and Jharkhand. The oral test was conducted by one examiner only. The examiners were trained for the oral test. The diagnosis of hypersensitivity was made by using a blast of air from a 3-way syringe for 8 s at a distance of 1 cm from the tooth surface and the reaction recorded. Sampling population the informed consent was signed by

each subject participating in the study. The subjects in the age range of 18 to 72 years experiencing dentin hypersensitivity were included in the study. The subjects were divided into five age groups. Females and males from all the age groups were randomly recruited into the study. Total 650 subjects were selected from the O.P.D. of Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India. Questionnaire and oral testing the subjects were informed about the examination by doctor. The questions about the age, gender, and education level were asked. The questionnaire also included pain inducing stimulus. The questionnaires were recorded regarding the subject's age, gender, and education level. The questions regarding pain inducing stimulus, treatment by desensitizing toothpaste, and any smoking habit were noted. The diagnosis of hypersensitivity was made by using a blast of air from a 3-way syringe for 8 s at a distance of 1 cm from the tooth surface and the reaction was recorded. [6] The recession associated with these teeth was also measured using a graduated periodontal probe. Exclusion criteria The following subjects were not included in the study population; these criteria have reference to Gillam's study. [7].

- Patients undergoing current desensitizing therapy i.e., tooth paste or in office desensitizing procedures
- the chronic use of anti-inflammatory, analgesic and mind altering drugs
- Pregnancy or breast feeding
- Allergies and idiosyncratic responses to product ingredients
- Eating disorders
- Chronic acid regurgitation
- Periodontal surgery in the preceding 3 months
- Orthodontic appliance treatment within previous 3 months.
- Teeth or supporting structures with any other painful pathology or defects
- Teeth restored in the preceding 3 months
- Abutment teeth for fixed or removable prostheses
- Crowned teeth
- extensively restored teeth.

Statistical analysis Statistical analysis was made using SPSS IBM version 20.0. The difference between the sexes was compared with the χ^2 test. The significant level $P \leq 0.05$ was considered statistically significant.

RESULTS

Questionnaire The prevalence of hypersensitivity was 48.9% and a total of 650 subjects reported hypersensitivity in the questionnaire evaluation [Table 1]. The females presented with a higher prevalence of sensitivity than the males. The subjects who reported hypersensitivity symptoms,

only 14.7% had received professional treatment. Those who did not plan to seek treatment were 70.8%. The use of desensitizing toothpaste was reported by 75.8% of subjects, in which 1.5% reported complete elimination of hypersensitivity, 32.4% reported that it was ineffective against hypersensitivity, and 40.0% reported some relief from hypersensitivity symptoms. The subjects who received periodontal treatment, 48.0% reported slight sensitivity, 18.0% obvious sensitivity, and 24.2% said that they are scared of undergoing periodontal treatment because of the hypersensitivity [Table 1]. oral test the oral test was done in 350 subjects who had dentine hypersensitivity. Therefore, the overall prevalence was 26%. Female subjects had a higher prevalence figure than the males in the oral test as well. The age group of 55–72 year had the highest number of

subjects with dentine hypersensitivity, whereas the 18–36 years old age group had the least in the questionnaire. The most common provoking factor was the presence of cold stimulus followed by sweet. Most of the subjects were experiencing hypersensitivity symptoms for more than 3 years [Table 2]. The mean number of sensitive teeth per subject reached a peak of 4.50 in the 55–72 years old group, 4.00 in the 37–54 years old group and 3.80 in the 18–36 years old group [Figure 1]. The most commonly affected tooth was lower premolar and the second molar was the least affected tooth.

Single factor covariance analysis was completed with the number of teeth affected by dentine hypersensitivity as an independent variable and age, gender, education level, smoking, gingival recession, and attachment loss were taken.

Table 1: Percentage and Number of subjects according to questionnaire:

Dentin hypersensitivity questions	Number	Percentage
Gender		
Female subjects reporting DH	360	55.3
Male subjects reporting DH	290	44.6
Professional treatment for DH	96	14.7
Yes	460	70.8
No(Never Planning to seek treatment)	81	12.6
No(Time or economic factor)	12	1.9
Use of Desensitizing toothpaste	260	40.0
Yes(reporting a relief)	10	1.5
Yes(reporting an elimination)	210	32.4
Yes(reporting complete inefficacy)	158	26.1
No		
Influence of Scaling on DH	72	48.0
Yes(Slight Sensitivity)	27	18.1
No(Obvious sensitivity)	53	35.3
Fear of Scaling due to DH produced	36	24.2

Table 2: The Oral Test Result

Gender	Number	Percentage
Female	210	60.0
Male	140	40.0
Age Group		
18-36	80	22.8
37-54	102	29.2
55-72	168	48.0
Type of Stimulus		
Cold	250	48.5

Sour	90	16.8
Hot	110	20.6
Sweet	40	7.6
Tooth brushing	30	5.6
Others	5	0.9

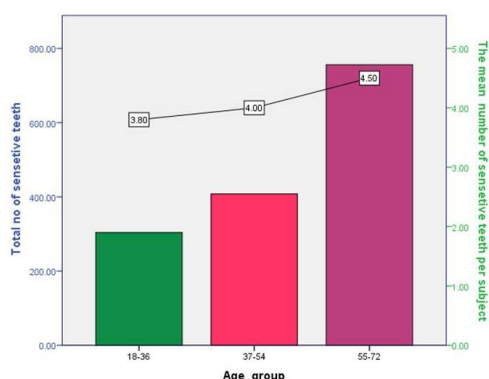


Fig 1: The mean number of sensitive teeth per subject with dentine hypersensitivity in the oral test.

DISCUSSION

The sample population was covered large populations of south Bihar and Jharkhand. There is major difference from the previous studies. This study has found that the total prevalence of dentine hypersensitivity was 48.0% in the questionnaire group and 26% in the oral testing group. Some studies that have been carried out with questionnaires had reported values of more than 50% or less than 20%. [3,8] The studies from academic setting have reported values of 30% or more.[2,9,10] There are studies from dental practices which have reported prevalence values from 4–15%.[4,11] The differences may be due to the type of sample and methods used in the studies. Keeping in mind the subjective nature of dentine hypersensitivity, all the subjects were not examined in the study. In fact some subjects without subjective feeling may also exhibit this problem. Additionally, the only method of blast of air may not be the diagnostic factor for all the subjects. Therefore, the prevalence in this study was expected to be slightly less than the actual prevalence of dentin hypersensitivity.

Most of the subjects who reported tooth hypersensitivity symptoms have never gone to the dentist for seeking treatment. Liu et al.[10] have

reported that only 5% of the subjects had sought professional help and 11% had tried the desensitizing toothpastes. Raghoobar[12] has reported that only 20% of the subjects investigated had received desensitizing treatments. The reasons cited for this may be that many subjects think that it is too trivial to refer to the clinicians and the problem of dentine hypersensitivity is not examined by dentists except when prompted by the patients. The toothpastes have been the most common prescription for the treatment to date. In our study, few subjects reported that they had complete relief after using the toothpastes. In a survey conducted by the Canadian Advisory Board on dentine hypersensitivity [13] it has been shown that some dentists (31%) and hygienists (16%) did not believe that the desensitizing toothpastes were able to relieve hypersensitivity symptoms. Dentine hypersensitivity has not been paid the required attention by the clinicians or the population in general. The current treatment methods for hypersensitivity symptoms do not seem to give enough relief from dentine hypersensitivity or their therapists. Therefore, it is very important that more awareness with public health education should be provided with greater focus on the management of dentine hypersensitivity and more effective treatment options should be developed. Some of the studies have reported that most of the patients undergoing periodontal treatment are susceptible to dentine hypersensitivity due to gingival recession caused by periodontal surgery or due to loss of cementum. In our study, it has also been found that most subjects reported hypersensitivity symptoms after scaling and were also reluctant to get periodontal scaling once again. This situation has highlighted that most of the dental therapists do not pay enough attention to possible post treatment sensitivity. The possibility of post scaling sensitivity should be explained to the patients to reduce anxiety levels. This also helps in gaining more cooperation in carrying out treatment recommendations. [14]

Some previous studies have also reported on the age distribution of dentine hypersensitivity, resulting in every age group being reported as the peak prevalence age group.[4,10,12,15] In our study, the peak prevalence in the age group of 50–59 years for both the number of subjects suffering from sensitivity and the mean number of sensitive teeth per sensitive subject. The study of Liu et al.[10] reported the same age group with greatest number of subjects in Taipei. A surprising finding in this study was that the value of mean number of sensitive teeth per sensitive subject in the 30–39 year old group was as high as the 50–59 years old group. The Canadian Advisory Board on Dentine Hypersensitivity [13] also considered that the prevalence of Dentine hypersensitivity could be underestimated for the young adult population in their report. This population should be given attention and related risk factors should be further studied.

The most common stimulus cited in the literature is response to cold. This was also found to be true in our study. The second most common stimulus was sweet stimulus in this study which is not in agreement with other previous studies.[12,16,17] Most of the studies have shown that the second most common stimulus was heat.[12,16,17] In our study, a sweet stimulus was mainly produced by intake of sweet food. There was sensitivity to sour stimuli as well.

Our study did not find any correlation of dentine hypersensitivity with smoking. Even though smokers will have more severe periodontal disease and attachment loss.[18] In a study by Rees et al.,[16] it was reported that dentine hypersensitivity may be more prevalent in the higher social groups but the sample may be biased by the fact that a number of regular attendees at dental surgeries belong to this social group. In our study, people with low socioeconomic background had more teeth with dentine hypersensitivity. It was not very clear whether higher prevalence of dentine hypersensitivity was related to degree of oral care.

It has been seen that dentine hypersensitivity occurs more commonly in females [19] and in teeth with gingival recession.[6] The results of our study also are supportive of these findings and periodontal attachment loss and gingival recession as factors responsible for dentine hypersensitivity.

Attachment loss happens prior to gingival recession. In conclusion, this cross-sectional study on dentine hypersensitivity in adult population showed that the prevalence in 18–72 years old subjects is 26%.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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