

Effect of Oral Habits on the Prevalence and Pattern of Dentin Hypersensitivity in Latur Population

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Abstract:

Background: Dentin Hypersensitivity is a common oral health problem in Latur district, since problems like gutka, pan masala, tobacco chewing and smoking is more prevalent here. There is a growing awareness that Dentin Hypersensitivity has become an increasingly important condition that merits investigation from diagnostic and problem-management perspectives. Few studies have been attempted to determine its prevalence with associated risk factors.

Aim: This study aims to determine the prevalence of clinically assessed and self-reported risk factors in a sample of Latur population affected with Dentin Hypersensitivity.

Methodology: This epidemiological study was done among patients coming to M.I.D.S.R. Dental college, Department of Conservative Dentistry and Endodontics, Latur regarding dentin hypersensitivity of teeth. Ethical committees permission was obtained from the institute and a sample size of 200 was selected. Patients were given questionnaire to evaluate the associated symptoms and their risk factors (habits). Oral examination was carried out and patients were categorized based on the associated risk factors for Hypersensitivity.

Result: Of the 200 patient examined, 120 were diagnosed as having dentin hypersensitivity, giving prevalence of 60% among them male & age group of 31-40 years are more common. Tooth sensitivity was found to be common among patient having Para-functional habit i.e. 84.2%. Similarly smokers & those who brush abnormally had more cases of dentin hypersensitivity i.e. 75% & 65.2% respectively.

Conclusion: A high level of dentin hypersensitivity has been in this study & more common among males. A linear finding was shown with age, para-functional, smoking & abnormal tooth brushing habit.

Key Words: Abnormal tooth brushing, Dentin Hypersensitivity, Para-functional habit, prevalence, ,smoking

I. Introduction

Dentin sensitivity (DH) is a common, painful dental condition that is frequently encountered in dental practice.^{1,2} There is a growing awareness that DH has become an increasingly important condition. Patients are likely to retain their teeth for long as a result of successful programs for caries prevention and periodontal disease management. Thus it is expected that research will focus more attention on the problem of dentin hypersensitivity.³

Dentine hypersensitivity (DH) may be defined as a transient pain arising from exposed dentine, typically in response to chemical, thermal, tactile, or osmotic stimuli, which cannot be explained by any other dental defect or pathology.⁴ It is a commonly encountered but frequently misunderstood clinical problem.⁵ Traditionally, the term dentine hypersensitivity was used to describe this distinct clinical condition; however, several authors have also used the terms cervical dentine sensitivity (CDS), cervical dentine hypersensitivity (CDH), dentine sensitivity (DS) and root dentine sensitivity (RDS) / root dentine hypersensitivity [RDH].⁴⁻¹¹

The prevalence of DH has been reported over the years in a variety of ways: as greater than 40 million people in the U.S. annually,¹² 14.3% of all dental patients,¹³ between 8% and 57% of adult dentate population,¹⁴ and up to 30% of adults at some time during their lifetime.¹⁵ Differences in national or regional economic development, daily diet, oral hygiene levels, and attitudes towards oral disease all will affect the detection rate of DH.¹⁶ Pain which is caused by dentin hypersensitivity hinders an individual's everyday activities, such as brushing, eating, drinking, speaking, and even breathing.¹⁷ However, a majority of the patients do not seek treatment for desensitizing their teeth, because they do not perceive dentin hypersensitivity as a severe oral health problem and prefer over the counter products when the problem becomes severe.¹⁸

Different factors may influence the incidence of DH. The majority of patients with DH are in the age group 30-40.¹⁹ Generally, the frequency of DH is more in females than in males.²⁰⁻²² The most commonly affected teeth with DH are incisors and premolars²¹⁻²³ and the least affected are molars; and the buccal aspect of the cervical area is the most affected site.^{21,24,25} Personal behavior including consumption of highly acidic drinks or food; overzealous dental hygiene and previous dental procedures like periodontal therapy that may result in dentin exposure have been associated with DH.^{2,26}

Several theories have been proposed to explain the mechanism of dentine sensitivity.¹³ The widely accepted hydrodynamic theory explains the mechanism of dentinal sensitivity.^{2,27} The theory suggests that

opening the dentinal tubules and exposing them to oral environment disturb their fluids and result in fluid movement force within the tubule's lumen.²⁷ The fluid movement in the dentinal tubules will eventually be propagated to the pulp and pulpal fluid movement will ensue. The later movement may stimulate the nerve endings in the pulp causing pain response.

The dental enamel or cementum loss exposes dentin because of tooth wear. Ultimately the dentinal tubules become open, and their contents become exposed to dynamic interactions with oral environment.²⁸ In this context, erosion is considered the most common wear form that removes cementum, exposes dentinal tubules and initiates DH. However, abrasion, abfraction and attrition may also be involved.²⁹

Previous studies on the prevalence of DH have produced diverse frequencies and inconsistent findings.³⁰ Some studies reported figures that ranged between 8-60.3% in patients examined in general dental clinics.^{20, 21,25,31,32}. However, a study on the prevalence of DH in patients undergoing periodontal treatment reported that the prevalence was 88%.³¹ These wide ranges were attributed to differences in sampling methodology. The results of questionnaire- dependent studies or those of self-reported DH may exaggerate the prevalence figures. Patients may not realize the difference between DH and sensitivity arising from other oral conditions.^{11,29}

There were no prevalence data with respect to dentine hypersensitivity in Latur population. The aim of the present study, to determine dentin hypersensitivity prevalence with associated risk factors was, therefore, to carry out across-sectional study of a group of patients attending the Restorative Dentistry Clinic at the M.I.D.S.R. Dental college & hospital, Latur.

II. Subjects and methods

The data were collected. The investigation was carried out in the form of a questionnaire followed by a clinical examination. All patients were clinically examined for dentine hypersensitivity regardless of their response to the questionnaire. Informed consent was obtained from all recruits. The inclusion and exclusion criteria are:

“2.1 Inclusion criteria”

- Selected teeth were those having any type of cervical lesion with dentin hypersensitivity taking into consideration abrasion, abfraction, erosion, and gingival recession as the primary etiological factors.
- The absence of sever systemic and / or psychological diseases, i.e., bulimia and uncontrolled diabetes mellitus.
- Patient who had not received professional treatment with desensitizing agents in the previous six months.
- Freely given informed consent by the patients as recommended by the World Medical Association.

“2.2 Exclusion criteria”

- Current and/or previous use of professional desensitizing treatment
- Use of over-the-counter desensitizing products within the previous six weeks
- Long-term use of anti-inflammatory, analgesic and psychotropic drugs
- Pregnancy or breast feeding
- Allergies and idiosyncratic responses to product in gradients
- Eating disorders
- Systemic conditions that cause or predispose patients to develop dentine hypersensitivity (eg. chronic acid regurgitation)
- Excessive dietary or environmental exposure to acids
- Periodontal surgery in the preceding three months
- Orthodontic appliance treatment within the previous three months

“2.3 Exclusion criteria for teeth”

- Teeth having extensive caries
- Cracks or fractures
- Grossly worn down teeth
- Extensive and unsatisfactory restorations
- Recent restorations
- Tooth mobility
- Recent treatment in a dental clinic in the last six months prior to the onset of the study

If the dentist received a positive response, the diagnosis was confirmed using a blast of air from a triple syringe and by ruling out other causes of sensitivity, such as caries. Where a diagnosis of Dentin Hypersensitivity was made, a study form was completed. This included details of the patients' age, gender and occupation, tobacco chewing habits, pan & betel nut chewing, smoking habits, Para-functional and tooth brushing habits, and any factor known to initiate the sensitivity.

III. Data analysis

Data were analysed using statistical software (SPSS 14.0 for Windows; SPSS, Inc, Chicago, Ill). Associations between the various variables and dentine hypersensitivity were tested using Chi-square test. Associations between dentine hypersensitivity and other variables were assumed to exist if a P value was <0.05.

IV. Result

Questionnaires for 200 patients, data showed that only 120 patients had dentine hypersensitivity. They were completed and necessary clinical examinations performed. When compare according to age wise, significant result were obtained with highest prevalence 29.2% in 31–40 year olds, whereas patients younger than 20 years were perceived to be the least prevalence 4.2%. (p=0.014) as illustrated in Figure1.

Figure 1. Shows the age distribution of patients with hypersensitive dentine.

In present study, around 60% of the participants were having dentine hypersensitivity which was more among males 66.7% (80/120) as their counter parts 33.3% (40/120)(p=0.013) (Table-1)

Table 1: Showing Dentin Hypersensitivity according to Sex

Gender	Dentine Hypersensitivity		P Value
	Present	Percentage	
Male	80	66.7%	0.013*
Female	40	33.3%	

Tobacco chewers were not significantly associated with Dentine Hypersensitivity, P>0.05 as shown in table 2.

Table 2: Showing Dentin Hypersensitivity according to Tobacco Chewing

Tobacco Chewer	Dentine Hypersensitivity		P Value
	Present	Percentage	
Present	40	33.3%	0.621#
Absent	80	66.7%	

Moreover, pan & betel nut chewers were not significantly associated with Dentine Hypersensitivity, P>0.05 as shown in table 3.

Table 3: Showing Dentin Hypersensitivity according to Pan & Betel nut chewing

Pan & Betel Nut chewer	Dentine Hypersensitivity		P Value
	Present	Percentage	
Present	15	12.5%	0.151#
Absent	105	87.5%	

Moreover, smoking and abnormal tooth brushing habit, were significantly associated with DH, P<0.05 as shown in table 4 & 5

Table 4: Showing Dentin Hypersensitivity according to Smoking

Smoking	Dentine Hypersensitivity		P Value
	Present	Percentage	
Present	29	24.2%	0.041*
Absent	91	75.8%	

Table 5: Showing Dentin Hypersensitivity according to Abnormal Brushing habit

Abnormal Brushing habit	Hypersensitivity		P Value
	Present	Percentage	
Present	41	34.2%	0.017*
Absent	79	65.8%	

A significant high frequency of dentine hypersensitivity was found in Para-functional habit as shown in table 6.

Table 6: Showing Dentin Hypersensitivity according to Para-functional

Para-functional	Hypersensitivity		P Value
	Present	Percentage	
Present	39	32.5%	0.001 **
Absent	101	67.5%	

V. Discussion

The aim of this study was to find the prevalence of Dentine Hypersensitivity in Latur district and investigate the associated factors associated with it.

DH has been studied for several years, and it is reported as a painful condition that originates from the exposure of dentinal tubules when the thickness of the enamel or cement is significantly reduced. Usually, the exposed area is subjected to several kinds of stimuli, resulting in sharp acute pain. This painful condition makes difficulty in eating and oral hygiene.[19]

The result of the present questionnaire and examination showed prevalence of dentine hypersensitivity as 60% which is high. Whereas Chrysanthakopoulos found it as 18.2% among dental patient in Greece.³³

But studies in Hong Kong found it as 67.7% in a clinic population,³⁴ and 68.4% in Nigerian population.³⁵ This prevalence was different among other studies conducted in dental practices and it varies from 2.8% to 57.2%.^{36,37} It could be due to various factors like drinking, consuming sweets, habits of brushing and smoking. Some of these studies have used questionnaires only without any clinical examinations. Whereas some studies showed lower results of dentine hypersensitivity as 25% in Brazil population³⁸ and 32.58% in Shanghai population.³⁷

Dentine Hypersensitivity was more among male population as compared to female and comparable results were seen in study done by Bamise et al in 2007.³⁹ However, many studies found that female were having more prevalence of dentine Hypersensitivity.^{40,41,42} It has been attributed to the fact that women have better overall healthcare and oral hygiene practices, which would make them more sensitive to dentine hypersensitivity.

It was also found that dentine hypersensitivity varies according to age which is also seen in many studies.^{43,44} The present study showed more frequency of dentine hypersensitivity among 31-40 years age group which was comparable to Amarasena N et al in 2011.⁴⁰ But some studies had shown in 18-27 years old age group.⁴⁵ and some in among 50-59 years old.⁴⁴ In individual >30years have more abrasion, attrition, gingival recession, but after 5th decade of life due to development of 2^o or sclerotic dentin dentine hypersensitivity declines.⁴⁶

The study showed that dentine hypersensitivity was not associated with tobacco & betel nut chewing habit which is comparable to AR Davari et al in 2013.⁴⁷ Tobacco & betel nut chewers had higher level of plaque & calculus. Plaque does not produce dentine hypersensitivity.

This study showed that dentine hypersensitivity was associated with Smoking which is comparable to V Vijaya et al in 2013⁴⁸ But some studies showed opposite result.⁴⁹ Smokers had greater periodontal destruction. Because of attachment loss, root surfaces become exposed, leading potentially to sensitivity.

This study showed that dentin hypersensitivity is associated with abnormal tooth brushing habit which is comparable to Addy M et al in 2005⁵⁰ but some studies shows different result⁵¹ and also showed that dentin hypersensitivity is associated with Para-functional habit which is comparable to AB Borges et al in 2012⁵² and A Arora et al in 2012⁵³ Dentin hypersensitivity occurs due to loss of tooth structure.

VI. Conclusion

This study revealed dentin hypersensitivity is 61% in Latur population, amongst them males and age group of 31-40 years are more prevalent. Smoking habit, Para-functional habit and abnormal tooth brushing forms deleterious effect on dentin hypersensitivity. So screening for dentine hypersensitivity at community level is required for early treatment.

Bibliography

- [1]. Wang Y, Que K, Lin L, Hu D, Li X , The prevalence of dentine hypersensitivity in the general population in China. J Oral Rehabil 39: 2012 , 812-820.
- [2]. Addy M, West NX, The role of toothpaste in the aetiology and treatment of dentine hypersensitivity. Monogr Oral Sci 23: 2013, 75-87.
- [3]. Cummins D, Dentine hypersensitivity: from diagnosis to a breakthrough therapy for everyday sensitivity relief. J Clin Dent 20: 2009, 1-9.
- [4]. Addy M, Urquhart E. , Dentine hypersensitivity: its prevalence, aetiology and clinical management. Dent Update 1992; 19:407-8, 410-2.
- [5]. Sykes LM., Dentine hypersensitivity: a review of its aetiology, pathogenesis and management.SADJ2007; 62:66-71.

- [6]. Martínez-Ricarte J, Faus-Matoses V, Faus-Llácer VJ, Flichy-Fernández AJ, Mateos-Moreno B., Dentinal sensitivity: concept and methodology for its objective evaluation. *Med Oral Patol Oral Cir Bucal* 2008;1:13.
- [7]. Sauro S, Mannocci F, Watson TF, Piemontese M, Sherriff M, Mongiorgi R., The influence of soft acidic drinks in exposing dentinal tubules after non-surgical periodontal treatment: a SEM investigation on the protective effects of oxalate-containing phytocomplex. *Med Oral Patol Oral Cir Bucal* 2007;1:12.
- [8]. Gillam DG, Bulman JS, Jackson RJ, Newman HN, Efficacy of a potassium nitrate mouth wash in alleviating cervical dentine sensitivity (CDS). *J Clin Periodontol* 1996; 23: 993-7.
- [9]. Sanz M, Addy M. Group D Summary. *J Clin Periodontol* 2002;29: 195-6.
- [10]. TROLL BV, Needleman I, Sanz M, Asystematic review of the prevalence of root sensitivity following periodontal therapy. *J Clin Periodontol* 2002; 29: 173-7.
- [11]. Addy M, Dentine hypersensitivity: new perspective sonanold problem. *Int Dent J* 2002; 52:367-75.
- [12]. Kanapka JA, Current treatment for dentinal hypersensitivity. A new agent. *Compend Contin Educ Dent* 1982;(Suppl3):S118-20.
- [13]. Dowell P, Addy M, Dentine hypersensitivity--a review. Aetiology, symptoms and theories of pain production. *J Clin Periodontol* 1983;10:341-50.
- [14]. Irwin CR, Mc Cusker P, Prevalence of dentine hypersensitivity in a general dental population. *J Ir Dent Assoc* 1997; 43:7-9.
- [15]. Addy M, Etiology and clinical implications of dentine hypersensitivity. *Dent Clin North Am* 1990; 34: 503-14.
- [16]. Walters PA, Dentinal hypersensitivity: A review. *J Contemp Dent Pract* 2005;6: 107-17.
- [17]. Lussi A, Schaffner M, Progression of and risk factors for dental erosion and wedge-shaped over a 6-year period. *Caries Res.* 2000; 34:182-7.
- [18]. KVV Prasad, R Sohoni, S Tikare, M Yalamalli, G Rajesh, SB Javali, Efficacy of two commercially available dentifrices in reducing dentinal hypersensitivity. *Indian J Dent Res.* 2010; 21:224-30.
- [19]. Irwin CR, McCusker P, Prevalence of dentine hypersensitivity in a general dental population. *J Ir Dent Assoc* 43: 1997, 7-9.
- [20]. Flynn J, Galloway R, Orchardson R, The incidence of 'hypersensitive' teeth in the West of Scotland. *J Dent* 13: 1985,230-236.
- [21]. Fischer C, Fischer RG, Wennberg A, Prevalence and distribution of cervical dentine hypersensitivity in a population in Rio de Janeiro, Brazil. *J Dent* 20: 1992, 272-276.
- [22]. Cunha-Cruz J, Wataha JC, Heaton LJ, Rothen M, Sobieraj M, et al, The prevalence of dentin hypersensitivity in general dental practices in the northwest United States. *J Am Dent Assoc* 144:2013, 288-296.
- [23]. Ye W, Feng XP, Li R. The prevalence of dentine hypersensitivity in Chinese adults. *J Oral Rehabil* 39: 2012,182-187.
- [24]. Chabanski, Gillam, Bulman, Newman, Prevalence of cervical dentin sensitivity in a population of patients referred to a specialist periodontology department. *J Clin Periodontol* 23:1996, 989-992
- [25]. Liu HC, Lan WH, Hsieh CC, Prevalence and distribution of cervical dentin hypersensitivity in a population in Taipei, Taiwan. *J Endod* 24: 1998,45-47.
- [26]. Türp JC (, Discussion: how can we improve diagnosis of dentin hypersensitivity in the dental office? *Clin Oral Investig* 17 Suppl 1:2013, S53-54.
- [27]. Brännström M, Aström A, The hydrodynamics of the dentine; its possible relationship to dentinal pain. *Int Dent J* 22: 1972,219-227.
- [28]. Eisenburger M, Addy M, Erosion and attrition of human enamel in vitro part I: interaction effects. *J Dent.* 30: 2002,341-347.
- [29]. Dababneh RH, Khouri AT, Addy M, Dentine hypersensitivity - an enigma? A review of terminology, mechanisms, aetiology and management. *Br Dent J* 187:1996, 606-611.
- [30]. Shiau HJ, Dentin hypersensitivity. *J Evid Based Dent Pract* 12: 2012,220-228.
- [31]. Taani SD, Awartani F, Clinical evaluation of cervical dentin sensitivity (CDS) in patients attending general dental clinics (GDC) and periodontal specialty clinics (PSC). *J Clin Periodontol* 29: 2002,118-122.
- [32]. Chabanski MB, Gillam DG, Bulman JS, Newman HN, Prevalence of cervical dentine sensitivity in a population of patients referred to a specialist Periodontology Department. *J Clin Periodontol* 23: 2002,989-992.
- [33]. Chrysanthakopoulos NA, Prevalence of Dentine Hypersensitivity in a General Dental practice in Greece. *J Clin Exp Dent* 2011;3(5):e445-51.
- [34]. Rees JS, Jin LJ, Lam S, Kudanowska I, Vowles R, The prevalence of dentine hypersensitivity in a hospital clinic population in Hong Kong. *J Dent* 2003;31:453-61.
- [35]. Bamise CT, Kolawole KA, Oloyede EO, Esan TA, Tooth sensitivity experience among residential university students. *Int J Dent Hyg* 2010;8:95-100.
- [36]. Chu CH, Pang KK, Lo EC. Dietary behaviour and knowledge of dental erosion among Chinese adults. *BMC Oral Health* 2010;10:13.
- [37]. Ye W, Wang GY, Lv J, Feng XP, The epidemiology of dentine hypersensitivity among adults I shanghai municipality. *Shanghai Kou Qiang Yi Xue* 2009; 18:247-50.
- [38]. Fischer C, Fischer RG, Wennberg A, prevalence and distribution of cervical dentine hypersensitivity in a population in Rio de Janeiro, Brazil. *J Dent* 1992; 20: 272-6
- [39]. Bamise CT, Olusile AO, Oginni AO, Dosumu OO, The prevalence of dentine hypersensitivity among adult patients attending a Nigerian teaching hospital. *Oral Health Prev Dent* 2007; 5:49-53.
- [40]. Amarasena N, Spencer J, Ou Y, Brennan D, Dentin hypersensitivity in a private practice population in Australia. *J Oral rehabil* 2011; 38:52-60
- [41]. Taani DQ, Awartani F, Prevalence and distribution of dentine hypersensitivity and plaque in dental hospital population. *Quintessence Int* 2001; 32:372-6
- [42]. 42. Gillam DG, Seo HS, Bulman JS, Newman HN, Perceptions of dentine hypersensitivity in a general practice population. *J Oral Rehabil* 1999;26:710-4.
- [43]. Udoye CI, Pattern and distribution of cervical dentine hypersensitivity in a Nigerian tertiary hospital. *Odontostomatol Trop* 2006; 29:19-22
- [44]. Liu HS, Lan WH, Hsieh cc, prevalence & distribution of cervical dentin hypersensitivity in population in Taipei, Taiwan. *J Endod* 1998; 24:45-7.
- [45]. Gillam DG, Aris A, Bulman JS, Newman HN, Ley F, Dentin hypersensitivity in subjects recruited for clinical trials: clinical evolution, prevalence & intraoral distribution. *J oral rehabil* 2002; 29:226-31.
- [46]. Brannstrom M. et al, Dentin hypersensitivity :etiology, risk factors & prevention strategies.1963(suppl):7-13.
- [47]. AR Davari, Eataei, H, Assarzadeh. dentin hypersensitivity :etiology, diagnosis & treatment. *J dent* 2013;14(3): 136-145.
- [48]. V Vijaya, Venkatararam Sanjay, Rana K Varghese, Association of dentin hypersensitivity with different risk factors- a cross sectional study.

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- [49]. Muller HP, Stadermann S, Heinecke A, Gingival recession in smokers & non smokers with minimal periodontal disease. J Clin Periodontol 2002 ;29: 129-36.
- [50]. Addy M , Tooth brushing, tooth wear & dentin hypersensitivity – are they associated? Int Dent J 2005;55(4 Suppl I):26 1-7.
- [51]. H Colak , BU Ayhkq , MM Hamidi , R Uzgur , Prevalence of dentin hypersensitivity among university students in Turkey. Nigerian journal of clinical practice 2011:15(4)
- [52]. AB Borges, pereira JC , Dentin hypersensitivity –etiology, treatment .jaypee journals.2012.
- [53]. A Arora, Shashi Rashmi Acharya, Comparative evaluation of dentin hypersensitivity and microleakage associated with composite restoration in cavities pre conditioned with air abrasion – an ex vivo study Contemporary clical dentistry .2012(3)306-313.