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 committies 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 diagnose 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 habit, 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].⁶⁻¹¹

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.¹⁵ The widely accepted hydrodynamic theory explains the mechanism of dentinal sensitivity.²,²² 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. 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. 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.

Previous studies on the prevalence of DH have produced diverse frequencies and inconsistent findings. Some studies reported figures that ranged between 8-60.3% in patients examined in general dental clinics. However, a study on the prevalence of DH in patients undergoing periodontal treatment reported that the prevalence was 88%. 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.

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:

“2.1Inclusion 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 severe 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.

“2.2Exclusion 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

“2.3Exclusion 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 & betal 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>
<thead>
<tr>
<th>Gender</th>
<th>Dentine Hypersensitivity</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>80</td>
<td>66.7%</td>
</tr>
<tr>
<td>Female</td>
<td>40</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Tobacco Chewer</th>
<th>Dentine Hypersensitivity</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>40</td>
<td>33.3%</td>
</tr>
<tr>
<td>Absent</td>
<td>80</td>
<td>66.7%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Pan &amp; Betel Nut chewer</th>
<th>Dentine Hypersensitivity</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>15</td>
<td>12.5%</td>
</tr>
<tr>
<td>Absent</td>
<td>105</td>
<td>87.5%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Smoking</th>
<th>Dentine Hypersensitivity</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>29</td>
<td>24.2%</td>
</tr>
<tr>
<td>Absent</td>
<td>91</td>
<td>75.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Abnormal Brushing habit</th>
<th>Hypersensitivity</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>41</td>
<td>34.2%</td>
</tr>
<tr>
<td>Absent</td>
<td>79</td>
<td>65.8%</td>
</tr>
</tbody>
</table>
A significant high frequency of dentine hypersensitivity was found in Para-functional habit as shown in table 6.

<table>
<thead>
<tr>
<th>Para-functional</th>
<th>Hypersensitivity</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>39</td>
<td>32.5%</td>
</tr>
<tr>
<td>Absent</td>
<td>101</td>
<td>67.5%</td>
</tr>
</tbody>
</table>

**V. Discussion**

The aim of this study was to find the prevalence of Dentin 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,[32] 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 population[38] 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.[33,43,44] The present study showed more frequency of dentine hypersensitivity among 31-40 years age group which was comparable to Amarasesa N et al in 2011.[40] But some studies had shown in 18-27 ears old age group,[43] and some in among 50-59 years old.[36] In individual >30years have more abrasion, attrition, gingival recession, but after 5th decade of life due to development of 2[40] 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 2013.[48] 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 2005[50] but some studies shows different result[33] and also showed that dentin hypersensitivity is associated with Para-functional habit which is comparable to AB Borges et al in 2012[52] and A Arora et al in 2012.[53] 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.

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