

Dentinal hypersensitivity – A questionnaire study

V. Lavanya¹, Dhanraj Ganapathy^{2*}, R. M. Visalakshi²

ABSTRACT

Aim/Background: Dentine hypersensitivity (DH) is a common finding with different prevalence rate. The aim of this study was to evaluate the prevalence of DH and associated risk factors and to study the prevalence of DH and related risk factors in common population of India. **Objective:** In contrast to the well-established caries epidemiology, data on dentin hypersensitivity seem to be scarce and contradictory. This questionnaire deals with dentin hypersensitivity and assesses its prevalence, distribution, and potential changes. **Materials and Methods:** A total of 200 subjects reporting dentine sensitivity were included in the study comprising 85 males and 115 females. Questionnaire regarding data such as gender, age, educational level were collected to assess the prevalence of DH in Chennai. The relationship between DH and social class which determined by the occupation status was examined. **Results:** Our study showed prevalence as 55% and it was more common among males. Similarly, smokers and those who use hard toothbrush had more cases of DH. Most aggravating factors were cold water (92%) and sweet foods (34.4%), whereas only 19.8% of the patients had it while brushing. **Conclusion:** Most commonly affected teeth were mandibular incisors. The other factors related to DH 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.

KEY WORDS: Dentine hypersensitivity, Oral test, Prevalence, Smoking, Toothbrush

INTRODUCTION

Dentine hypersensitivity (DH) is a very common dental condition. It has been defined as a short, sharp pain arising from exposed dentine response to thermal, chemical, tactile, and evaporative stimulus and which cannot be related to any other dental defect or pathology. DH is a common problem found in many adult populations with prevalence figures reported to range between 4% and 67.7%. This wide variation in prevalence has been presumed to be due to a number of factors, including different methods used to diagnose the condition (clinical examination, questionnaire, etc.), variation in the consumption of erosive drinks, variation in the type of sample population, and the type of setting where the study was carried out.^[1,2] Patients usually do not report this painful condition to their dental practitioners and when they do, they report experiencing sharp pain after a number of stimuli's. DH

has a strong effect on eating, drinking, and sometimes breathing. Severe conditions of it may result in emotional changes that alter behavior. DH is a common oral problem among adult population. Incidence of DH increases with advancing age. Many studies reported that DH was commonly seen in adult populations, with prevalence ranging from 25% to 40%.^[3,4] Studies also showed different results of DH according to tooth numbering, some reported that the most common teeth affected were premolars, whereas it was found lower incisors in another study. Hence, knowing the variability of the disease and its multifactorial risk factors, this survey is being conducted to know the prevalence of dental hypersensitivity.^[5,6] "DH is characterized by short, sharp pain arising from exposed dentine in response to stimuli, typically thermal, evaporative, tactile, osmotic, or chemical and which cannot be ascribed 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.^[7]

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Etiopathogenesis

Anatomy of dentine-pulp complex

Dentine is covered and protected by hard tissues such as enamel or cementum. Dentin itself is a vital tissue, consisting of dentinal tubules, and is naturally sensitive due to extensions of odontoblasts and formation of dentine-pulp complex. Although dentin and pulp are histologically different, their origin is embryologically from the same precursor, i.e., the ectomesenchyme. Pulp is integrally connected to dentine, i.e., physiologic and/or pathologic reactions in one of the tissues will also affect the other. Dentin consists of small canal such as spaces and dentinal tubules. These tubules occupied by odontoblastic processes. The odontoblastic processes may extend through the entire thickness of dentin from pulp to dentinoenamel junction. The odontoblastic processes are actually the extensions of odontoblasts, which are the major cells of pulp-dentin complex. The odontoblastic processes are surrounded by dentinal fluid inside the tubules. The dentinal fluid forms around 22% of total volume of dentin. It is an ultrafiltrate of blood from the pulp through dentinal tubules and forms a communication medium between the pulp (through the odontoblastic layer) and outer regions of the dentin.^[3,4,8,9]

Pathogenesis

It has been stated in literature that DH develops in two phases: Lesion localization and lesion initiation. Lesion localization occurs by loss of protective covering over the dentin, thereby exposing it to external environment. It includes loss of enamel through attrition, abrasion, erosion, or abfraction. Another cause for lesion localization is gingival recession which can be due to toothbrush abrasion, pocket reduction surgery, tooth preparation for crown, excessive flossing, or secondary to periodontal diseases. Dentin consists of small canal such as spaces and dentinal tubules.^[10] These tubules occupied by odontoblastic processes. The odontoblastic processes may extend through the entire thickness of dentin from pulp to dentinoenamel junction. The odontoblastic processes are actually the extensions of odontoblasts, which are the major cells of pulp-dentin complex. The odontoblastic processes are surrounded by dentinal fluid inside the tubules. The dentinal fluid forms around 22% of total volume of dentin. It is an ultrafiltrate of blood from the pulp through dentinal tubules and forms a communication medium between the pulp (through the odontoblastic layer) and outer regions of the dentin.^[11]

MATERIALS AND METHODS

A total of 200 subjects reporting dentine sensitivity were included in the study comprising 85 males and 115 females. questionnaire regarding data such as gender, age, educational level (primary, secondary,

college, university) Prevalence of DH in Chennai. The relationship between DH and social class which determined by the occupation status was examined using the Registrar General's Classification of occupations as used by Bradnock *et al.* A randomly chosen sample of (20%) individuals was reexamined clinically by the same dentist to establish the intraexaminer variance. After consideration of the code numbers of the double examined participants, no differences were recorded between the first and the second clinical assessment. It is obvious that in this case, the intraexaminer consistency of clinical recordings, occupation status, teeth affected by hypersensitivity, any factor that initiated the sensitivity (cold/hot drinks, cold/hot food, sour stimuli, tooth brushing, and sweet food), and the last visit to the dentist. All the subjects completed an interview and the subjects reporting DH were examined further.^[12-14]

This epidemiological study was done among patients coming to dental college regarding the prevalence of DH. A self-structured questionnaire along with clinical examination was done for assessment. Descriptive statistics were obtained and frequency distribution was calculated.

Study Population

After obtaining ethical permission from the institute, survey was started and a sample of 200 was finalized including 85 males and 115 were female. Those who were having permanent teeth were taken into the study; patients with fractured and carious teeth were excluded from the study. A written informed consent was obtained from all the participants.

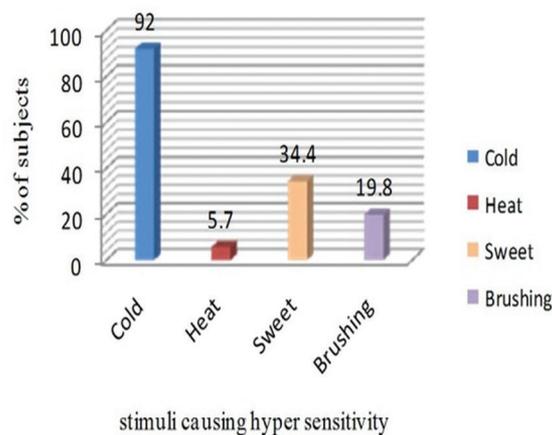
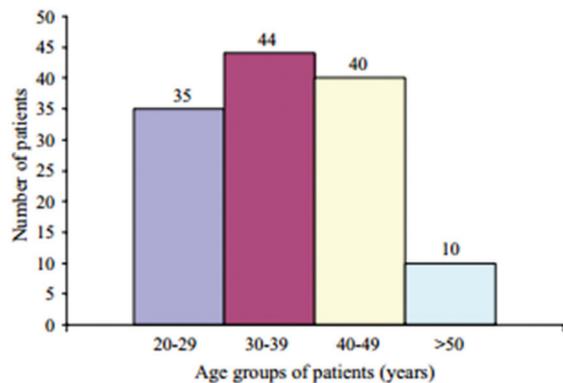
Examination

In case, the response was positive, the diagnosis of DH was confirmed using a blast of air from a syringe of dental unit. In cases, the response was doubtful, a piece of cotton impregnated in cold water was used to confirm the definitive diagnosis of DH. To estimate the apicocoronal width of recession, linear measurements of gingival recession were obtained from the cementoenamel junction up to the gingival margin in teeth presenting with gingival recession. A William's mm probe was used for the purpose and the midfacial buccal surfaces of all teeth were examined except for the third molars. Teeth with cervical carious or wear lesions were included in the study to estimate the apicocoronal width of recession but were excluded from the assessment of DH prevalence, as all teeth with carious or wear lesions at any tooth surface. A pretested self-administered questionnaire was used to gain information.^[15,16]

Study

A total of 200 patients were included in the study. Every patient was diagnosed with dentinal hypersensitivity giving an overall DH prevalence of 30.7%, males

(70%) have a higher prevalence of DH than females 30% by questionnaire have been attributed to the fact that women have better overall health care and oral hygiene awareness, which would make them more brushing and, in turn, increased sensitive.



RESULTS

A total of 200 patients were included in the study. Every patient was diagnosed with dentinal hypersensitivity giving an overall DH prevalence of 30.7%, males (70%) have a higher prevalence of DH than females 30% by questionnaire have been attributed to the fact that women have better overall health care and oral hygiene awareness, which would make them more brushing and, in turn, increased sensitive. Our study showed prevalence as 55% and it was more common among males. Most aggravating factors were cold water (92%) and sweet foods (34.4%), whereas only 19.8% of the patients had it while brushing. It is also known that the prevalence of DH varies with the age most common age group having DH was found in the following are 30–39 year old group (34.1%). The prevalence of DH was 25% in the oral test. The subjects receiving the treatment of hypersensitivity were only 15.1%.

DISCUSSION

An elderly patient had comparatively less hyper sensitivity; this may be due to sclerotic dentin deposition

with age. The previous studies reported the peak prevalence at ages of 20–29 years old,^[11] 30–39 years old,^[5,12] 31–40 years old,^[13] and 30–39 years old,^[4,14,15] in our present study, the prevalence was more between 30 and 39 years old. Similarly, smokers and those who use hard toothbrush had more cases of DH. Step-wise multiple linear regressions showed that the best predictor for DH was age followed by habit of smoking and type of toothbrush.

Lingual side of tooth has more sensitivity which is found out among 200 patients and only 24.8% of subjects with DH used desensitizing toothpaste. In this study, the first molar was the most commonly affected tooth, followed by premolar; the incisors were the least sensitive teeth.^[17]

Several previous studies found that response to cold was the most common stimulus for DH. Highly acidic foods and drinks and increased oral hygiene awareness implicated in the etiology of tooth erosions which may have contributed to dentine exposure and, hence, DH. The major stimulus that caused DH was cold drinks followed by hot drinks, toothbrushing, and sour stimuli. The greatest cause for DH was cold. Acidic fruit and hard food were significantly associated with DH. Intake of dietary acids and timing of toothbrushing may be an important etiology of DH since acidic fruits may remove the dental smear layer resulting in open dentinal tubules.^[18]

Smoking has been documented as a major risk factor for periodontal disease and attachment loss with attachment loss; root surfaces are exposed potentially leading to DH. Therefore, our study investigated whether DH was associated with smoking or not. The first molar was the most commonly affected tooth. DH was more common among females. Smoking was not associated with DH.^[19] The older group in the 30–39 years had the highest number (98%) of subjects with DH.

CONCLUSION

Most commonly affected teeth were mandibular incisors. The other factors related to DH 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.

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