

PREVALENCE OF DENTINE HYPERSENSITIVITY AMONG THAI DENTAL PATIENTS AT THE FACULTY OF DENTISTRY, MAHIDOL UNIVERSITY

Tasanee Tengrungsun¹, Yupapan Jamornnum¹ and Sawanee Tengrungsun²

¹Department of Advanced General Dentistry, Faculty of Dentistry, Mahidol University, Bangkok; ²Department of Community Medicine, Faculty of Medicine, Thammasart University, Pathum Thani, Thailand

Abstract. This study aimed to investigate the prevalence of dentine hypersensitivity (DH) and its associated etiological factors among Thai patients visiting the Faculty of Dentistry, Mahidol University, Thailand. Questionnaires were administered to 420 patients to obtain demographic information, dental history, eating habits and DH symptom data. The diagnosis of DH was established by a short, sharp pain arising from exposed dentine in response to triple-syringe air blow and exploration of the tooth surface. The chi-square test was used to analyze the association between DH and various types of stimuli. The level of statistical significance was set at $p < 0.05$. Of the 420 patients studied, 129 (30.7%) had DH in 198 teeth. Women (70.5%) were affected more often than men. The age range with the highest incidence of DH was the 30-39 year old group (34.1%). The first molar (29.3%) was the most frequent sensitive tooth. Cold (36.4%) was the most common cause of DH. Hard food and acidic fruits were also significantly associated with DH. DH has a moderate prevalence among Thais and is associated with cold and consumption of hard food, and sour fruits.

Keywords: dentine hypersensitivity, prevalence, Thai dental patient

INTRODUCTION

Dentine hypersensitivity (DH) is defined as a short, sharp pain arising from exposed dentine, typically in response to chemical, thermal, evaporative, tactile or osmotic stimuli which cannot be explained by any other dental defect or pathology (Addy and Urquhart, 1992). The hydrodynamic theory of fluid move-

ment in dentinal tubule seems to be the most widely accepted mechanism for DH (Brannstrom, 1992).

Dentine exposure may be caused by trauma, gingival recession, periodontal disease or various restorative procedures. The prevalence figures for DH vary widely (13%-74%) (Flynn *et al*, 1985; Addy and Urquhart, 1992; Fischer *et al*, 1992; Chabanski *et al*, 1996; Chabanski and Gillam, 1997; Liu *et al*, 1998; Verzak *et al*, 1998; Rees, 2000; Gillam *et al*, 2001; Taani and Awartani, 2001; Clayton *et al*, 2002; Rees and Addy, 2002; Rees *et al*, 2003; Rees and Addy, 2004).

The aim of this study was to carry out

Correspondence: Dr Tasanee Tengrungsun, Department of Advanced General Dentistry, Faculty of Dentistry, Mahidol University, 6 Yothee Street, Bangkok 10400, Thailand.
Tel: 66 (0) 2203 6530; Fax: 66 (0) 2203 6530
E-mail: tasanee.ten@mahidol.ac.th

a cross sectional study to determine the prevalence of DH among Thais and the possible causal factors among patients attending a university dental hospital in Bangkok, Thailand.

MATERIALS AND METHODS

A total of 420 patients (132 males, 288 females) attending the dental clinic at the Faculty of Dentistry, Mahidol University were selected for the study.

The study was approved by the Ethics Committee of the Faculty of Dentistry and informed consent was obtained from each recruit. This study was conducted from November 2008 to December 2008. The investigation was carried out in the form of a questionnaire followed by a clinical examination. Questionnaires were used to obtain general, dental, and behavioral characteristics and DH related symptoms. Adult subjects aged 20 years or older were interviewed and examined by one investigator. DH was diagnosed based on a short, sharp pain arising from exposed dentine in response to triple-syringe air blow and exploration of the tooth surface. Any teeth carious, cracked or fractured teeth were excluded from the study. Patients who were unable to communicate, took analgesic drugs or tranquilizers were excluded from the study.

The data were analyzed and frequency of distribution was calculated. The chi-square test was used to analyze the association between sensitive teeth and various causal factors. The level of significance was set at $p < 0.05$.

RESULTS

A total of 420 patients were included in the study. One hundred twenty-nine patients were diagnosed with DH (198

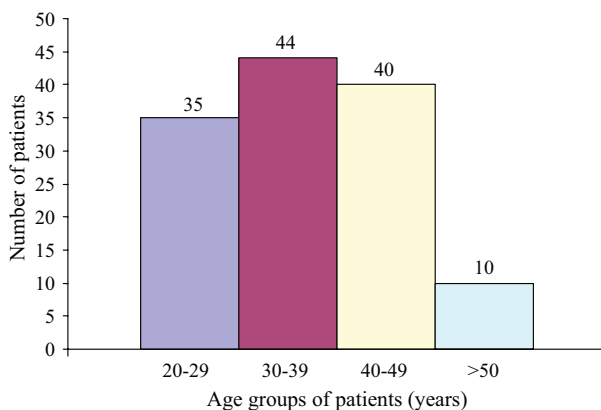


Fig 1–The age distribution of the patients with dentine hypersensitive teeth.

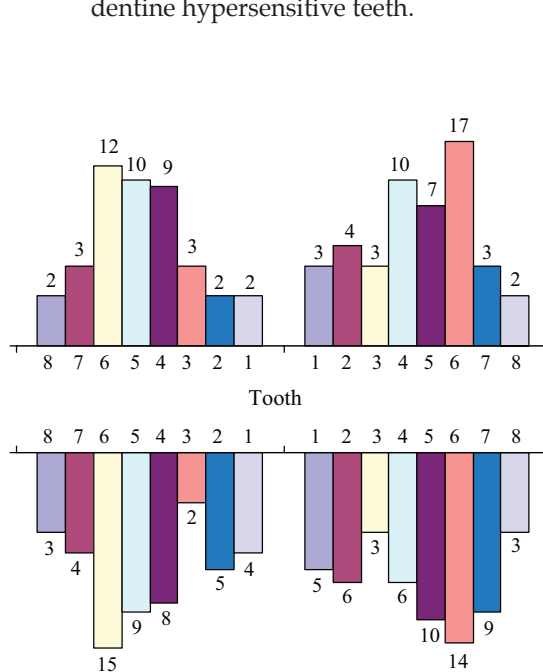


Fig 2–Dentine hypersensitive by tooth.

teeth) giving an overall DH prevalence of 30.7%.

Females (70.5%, $n=91$) has a higher prevalence of DH than males (29.5%, $n=38$) by questionnaire. The most common age group having DH was the 30-39 year old group (34.1%). The age distribution of patients with DH is shown in Fig 1.

The prevalence of DH varied significantly by age group ($p < 0.05$).

The prevalence of DH by tooth type is shown in Fig 2. The first molar was the most commonly affected tooth (29.3% $n=58$).

The various provoking factors are shown in Fig 3. Cold drinks and/or food were the major cause of DH (36.4%; $n=47$).

Seventy-three point six percent of subjects reported the DH symptoms lasted for < 1 minute after the stimulus, 17.8% suffered for 1-5 minutes, 0.8% suffered for 6-10 minutes and 7.8% suffered for more than 10 minutes (Fig 4).

The classification of patients by smoking history is shown in Fig 5. We found no significant association between smoking and DH.

Fifty-eight of 129 patients with DH preferred to eat high acidic fruit and 15 of 31 patients with DH preferred to eat hard food. The chi-square test showed a significant association between highly acidic fruits and DH and between hard foods and DH (Figs 6, 7).

Only 24.8% of subjects with DH used desensitizing toothpaste.

DISCUSSION

The overall prevalence of DH in this study was 30.7%, similar to a study by Liu *et al* (1998) at a university dental clinic in Taiwan.

The age of the patients in this study may have influenced the prevalence of DH. Orchardson and Collins (1987) reported a peak prevalence of DH in subjects aged 20-25 years, Fischer *et al* (1992) reported the peak in subjects aged 40-49 years, Chabanski *et al* (1997) reported the peak at 40-49 years, Liu *et al* (1998) reported the peak at 50-59 years and

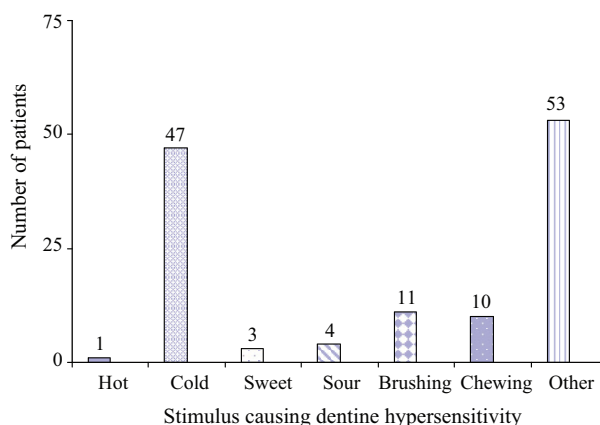


Fig 3—Number of patients having dentine sensitivity by type of stimulus.

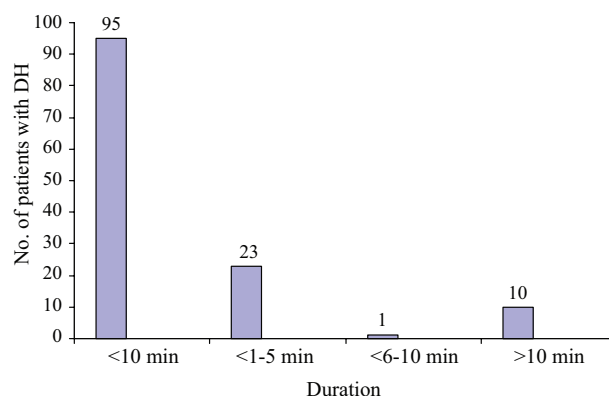


Fig 4—Number of patients having dentine hypersensitivity by duration of sensitivity. DH, dentine hypersensitivity

Rees (2000) reported the peak prevalence of DH at 30-39 years. Although cervical dentine exposure may increase with age, DH occurred in those aged 20-59 years. The reason of this may be age-related changes in dentine and pulp (Flynn *et al*, 1985). Although the prevalence of DH was higher among females, this was not statistically significant, similar to the study of Chabanski and Gillam (1997). The reason for this difference is not clear, but it could be related to women having better overall oral hygiene awareness and dental clinic

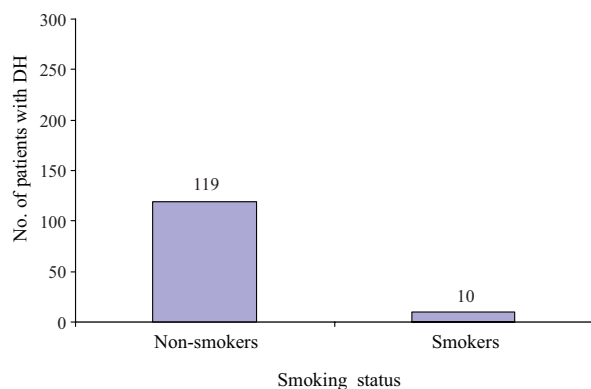


Fig 5—Number of patients with dentine hypersensitivity by smoking status. DH, dentine hypersensitivity

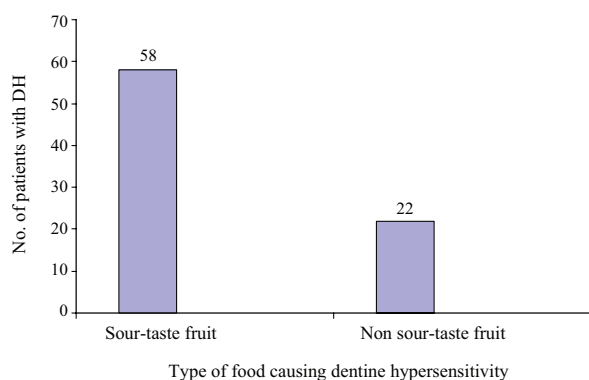


Fig 6—Number of patients with dentine sensitivity by type of food. DH, dentine hypersensitivity

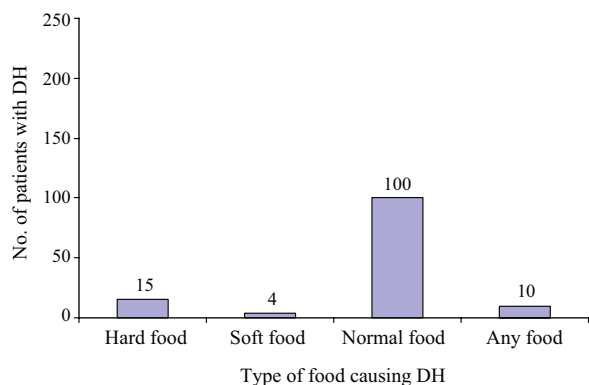


Fig 7—Number of patients with dentine hypersensitivity by type of food. DH, dentine hypersensitivity

attendance (Briscoe, 1987).

In this study, the first molar was the most commonly affected tooth, followed by premolar; the incisors were the least sensitive teeth. These findings are similar to those of Liu *et al* (1998) and Rees *et al* (2004). The first molar and premolar regions could be the most common sites for DH due to toothbrush abrasion (Orchardson and Collins, 1987; Rees, 2000). Chabanski *et al* (1996) found among patients referred for periodontal evaluation the molars were the most common teeth with DH.

Several previous studies found response to cold was the most common stimulus for DH (Flynn *et al*, 1985; Orchardson and Collins, 1987; Fischer *et al*, 1992; Chabanski *et al*, 1997; Rees, 2000; Clayton *et al*, 2002; Rees and Addy, 2002; Rees *et al*, 2003). In the present study, 36.4% of patients had cold induced DH. Our results were obtained by questionnaire and clinical examination. A cold stimulus was the greatest cause of discomfort in both occidental and oriental populations (Gillam *et al*, 2001).

Chabanski *et al* (1996) found 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. Addy *et al* (1987b) stated intake of dietary acids and timing of tooth brushing may be an important etiology of DH since acidic fruits may remove the dentinal smear layer resulting in open dentinal tubules. These findings are also in agreement with a study by Clayton *et al* (2002). Hard food was significantly related to DH ($p \leq 0.5$ by chi-square test). This finding is explained by Bamise *et al* (2008) who found high fiber food is coarse, like tiny gravel, and causes attrition when

chewing leading to DH. Patients with DH should be advised to reduce acidic fruit and hard food.

Smoking has been documented as a major risk factor for periodontal disease and attachment loss (Haber *et al*, 1993). With attachment loss, root surfaces are exposed potentially leading to DH. Therefore, our study investigated whether DH was associated with smoking or not. We found no association between DH and smoking. Our findings support those of Müller *et al* (2002) and Rees *et al* (2003).

In conclusion, the prevalence of DH among Thais > 20 years old attending a dental clinic at the Faculty of Dentistry, Mahidol University in Thailand was 30.1%. First molar was the most commonly affected tooth. DH was more common among females. The greatest cause for DH was cold. Acidic fruit and hard food were significantly associated with DH. Smoking was not associated with DH.

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