

# Epidemiology of Dentin Hypersensitivity

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## Abstract

**Introduction:** In contrast to the well-established caries epidemiology, data on dentin hypersensitivity seems to be contradictory. This study evaluates and assesses the prevalence, distribution and potential changes in case of dentin hypersensitivity.

Dentin hypersensitivity is described as a short, sharp pain, arising from exposed dentin in response to stimuli – thermal, evaporative, tactile, osmotic or chemical. The pain generally disappears when the stimulus is removed. Sensitivity may be associated with tooth bleaching procedures, exposed dentinal tubules as a result of gingival recession, erosion, subsequent loss of cementum on root surface, abfraction in combination with vigorous tooth brushing. In spite of various treatment approaches such as careful brushing instructions, desensitizing toothpaste, fluoride application, or dentin bonding agents, there is no appropriate scientific information about prevention and treatment.

**Purpose:** Investigation of the epidemiology of dentin hypersensitivity.

**Materials and methods:** Dental students in Medical university of Varna and their patients, and patients from a Private dental practice in Dobrich fill two questionnaires concerning symptoms of dentin hypersensitivity and assessing the incidence of this problem.

**Conclusion:** Dentin hypersensitivity is a clinically relevant problem. It affects the quality of life of patients and therefore it should be properly addressed in research, dental education, prevention and treatment.

**Keywords:** Epidemiology, Dentin hypersensitivity

## Introduction

Dentin hypersensitivity (DH) is characterized by short, sharp pain, arising from exposed dentin in response to stimuli, typically thermal, evaporative, tactile, osmotic and chemical and which cannot be ascribed to any other form of dental defect or disease (1). The pain generally disappears when the stimulus is removed. In contrast to the well-established caries epidemiology, data on dentin hypersensitivity seems to be wide-ranged and sometimes contradictory. Sensitivity may be associated with tooth bleaching procedures, exposed dentinal tubules as a result of gingival recession, erosion, subsequent loss of cementum on root surface, abfraction with or without combination of vigorous tooth brushing. In spite of the various treatment approaches such as careful brushing instructions, desensitizing toothpastes, fluoride application, dentin bonding agents, there is no satisfactory scientific information about prevention and treatment. Dentin hypersensitivity, besides directly causing patient's discomfort, may indirectly pose other problems, in particular those associated with reduced oral hygiene.

Despite the reported prevalence of DH, it is noteworthy that a relatively small share of sufferers seeks professional treatment to alleviate their condition and/or use everyday sensitivity relief toothpaste. Discomfort from dentin hypersensitivity is a common finding in adult population, ranging between 4,0-67,7% (2). In general, a slightly higher incidence of DH is reported in females than in males which may reflect their overall healthcare and better oral hygiene awareness (3).

Most sufferers range in age from 20 to 40 years but the peak is at the end of the third decade (4). Most affected areas are buccal cervical areas of permanent teeth, followed in descending order by canines, first premolars, incisors, second premolars and molars. And in the era of preventive dentistry, more adults will retain their teeth into later life and this could lead to increased number of exposed dentine surfaces because of periodontal therapy and home care procedures.

## Purpose

Investigation of the epidemiology of dentin hypersensitivity.

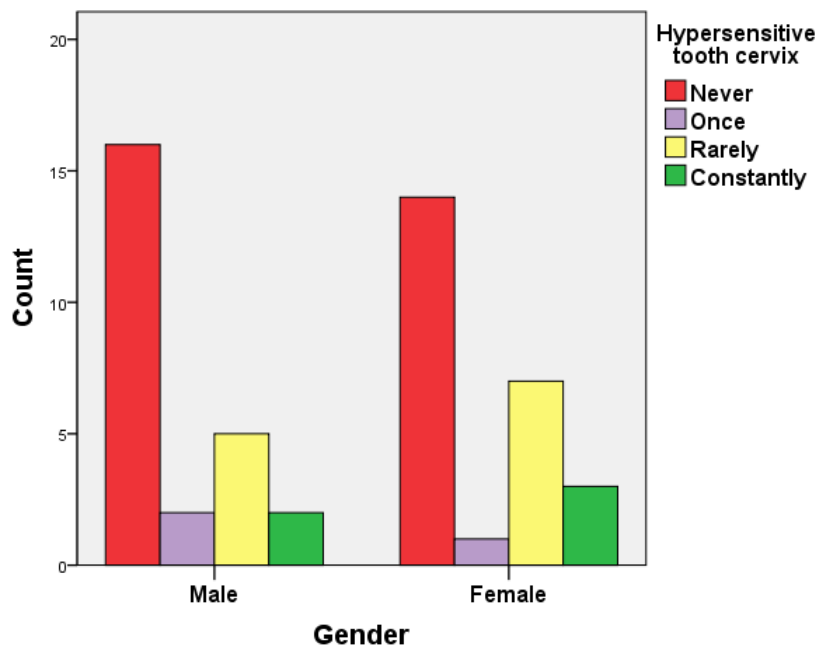
## Material and Methods

Dental students in Medical university of Varna and their patients and patients from a Private dental practice in Dobrich, fill two questionnaires concerning symptoms of dentine hypersensitivity and assessing the incidence of this problem. Some of the questions are about the symptoms of the problem, frequency, provoking factors, diet, system diseases, social aspect of the problem, and others concern treatment of DH and rate of success.

## Results and Discussion

50 patients are investigated – 25 females and 25 males. The average age is  $27.00 \pm 1.11$  years. Age distribution in the group is quite irregular (Shapiro- Wilk test,  $p = 0,000$ ), with prevalence of patients at age of 22-23 years.

10% of the participants report for constant sensitivity in the cervical area and 30% – for single or recurrent manifestation. Distribution among both genders is similar (Fig. 1) – 8% of males and 12% of females are with constant sensitivity. The share of females with various frequency hypersensitivity manifestation is larger than the males' one but gender is not determinative for the development of this condition ( $T= 0,096$ ,  $p= 0,472$ ).



**Figure 1: Gender distribution of dentin hypersensitivity**

Rees et al. publish the results of their investigations, made in Australia in 2002, which are similar to ours. They conclude that the incidence of hypersensitivity ranges between 10 and 30 % of the general population (5). Females are suffering more often than males but the difference is not statistically significant. The relationship between hypersensitivity and ageing is unclear. Reports in the literature indicate that most sufferers range in age from 20 to 40 years with the peak incidence occurring at the end of the third decade (4).

Different factors may facilitate the hypersensitivity occurrence (Table 1). The investigated patients are divided into 3 main groups, according to symptom manifestation – individuals with constant, rare or single manifestation of DH.

Many factors may provoke the appearance of the condition. Cold provocation causes pain in 60% of patients with constant manifestation of the problem, in 50 % of these with rare symptoms, and in 66,7 % of persons with single DH symptoms. Similar are the data, presented by Wang et al. They investigate general population in China and results show prevalence of problem of 34,5%. Most affected teeth are premolars and the most provoking factor – cold stimulus (6).

**Table 1: Hypersensitivity manifestations in relation to different provocation factors**

Hypersensitivity manifestations	Group 1	Group 2	Group 3
Factor	Constant	Rare	Single
<b>Cold provocation</b>	60%	50%	66.7%
<b>During brushing</b>	20%	8.3%	-
<b>Brush always horizontally</b>	40%	16.7%	66.7%
<b>Brush always forcibly</b>	40%	8.3%	-
<b>Bleaching</b>	40%	41.7%	13.4%
<b>Citrus fruits and fresh drinks (constantly)</b>	60%	25%	33.3%
<b>Vomiting (sporadic)</b>	-	16.7%	33.3%

Tooth brushing provokes symptoms in 20% of patients with constant DH, but none of investigated with single manifestations of DH determine it as a provocative factor. Different parameters of brushing may also play a role. Horizontal brushing is specific for 2/3 of patients with single manifestations of DH, and 40% of these with constant DH brush forcibly.

Greek researchers investigate group of 767 persons. They divide participants in two groups: with and without DH. About 21,3% have at least one cervical dentin hypersensitivity reaction to the tactile stimulus and 38,6 %, to air-blast stimulus (7).

Haneet et al. investigate 404 patients with diagnosed DH. Problem is correlated with gingival recession, abrasion and erosion and all of them are significantly correlated with brushing once a day in a horizontal direction and use of a toothbrush with medium-hardness bristles (8).

Great part of patients in group 1 and group 2 have had bleaching procedures before, but single manifestations of DH can hardly be attributed to bleaching (13,4%). Results of de Paula et al. differ from ours – they investigate group of 40 patients who have had in-office bleaching procedures. 60 % of these patients report DH (9).

Constant citrus fruits and fresh drinks consumption is a main provoking and aggravating factor in hypersensitivity manifestation, especially in cases of constant DH. Sovik et al. also prove that dental erosive wear, symptomatically measured mainly by DH, is due to high consumption of sour sweets and sports drinks (10).

Sporadic vomiting is confirmed in 16,7% of group 2 and in 33,3% of group 3. Many researches show identical results. Spigset investigates group of women, suffering of Bulimia nervosa – 47% of them report to have dentine hypersensitivity (11). Other scientists investigate group of people, 18-35 years old.

Patients complete a questionnaire regarding the nature of their DH, erosive dietary intake and tooth-brushing habits. Results show associations between DH and risk factors including heartburn/acid reflux, vomiting, sleeping medications, energy drinks, smoking, and acid dietary intake (12).

Hypersensitivity or dental pain even, appears in case of abrasion – correlation is moderate ( $t= 0,455$ ,  $p= 0,000$ ). Lutskaia et al. conclude in their investigations in Russia that most affected age group is 25-34 and teeth with high sensitivity show signs of abrasion (74,1%), most often on the vestibular surface (13).

Various measures are taken for the treatment of this condition.

- ✓ 40% of participants with constant hypersensitivity and 50 % of these with sporadic sensation use constantly tooth pastes for sensitive teeth (Fig.2).
- ✓ These pastes help mainly to patients with sporadic complaints. Duration of effect is usually to 2 weeks.
- ✓ 20 % of patients with constant and 25 % of these with sporadic hypersensitivity, had desensitizing procedures, applied by a dentist.

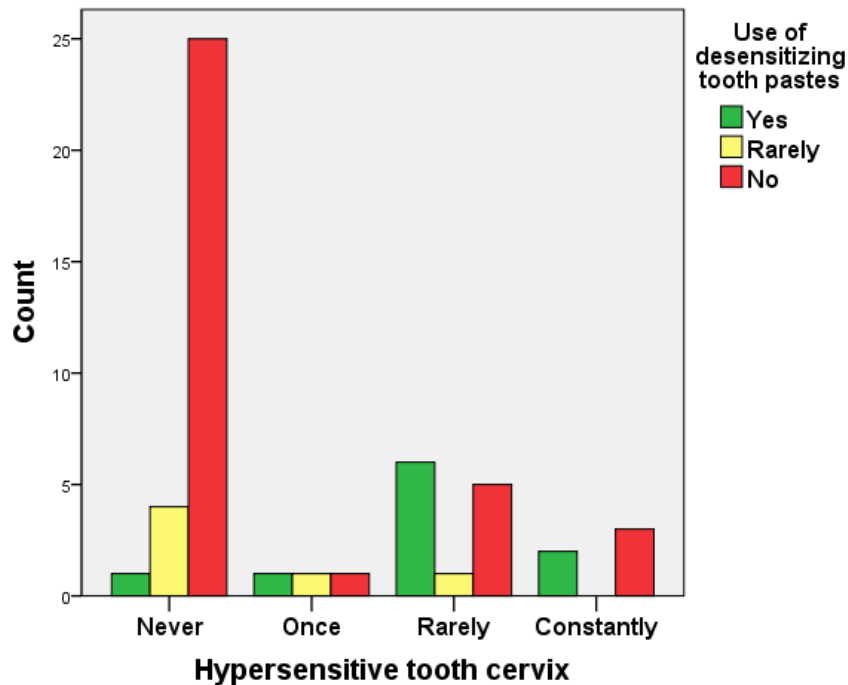
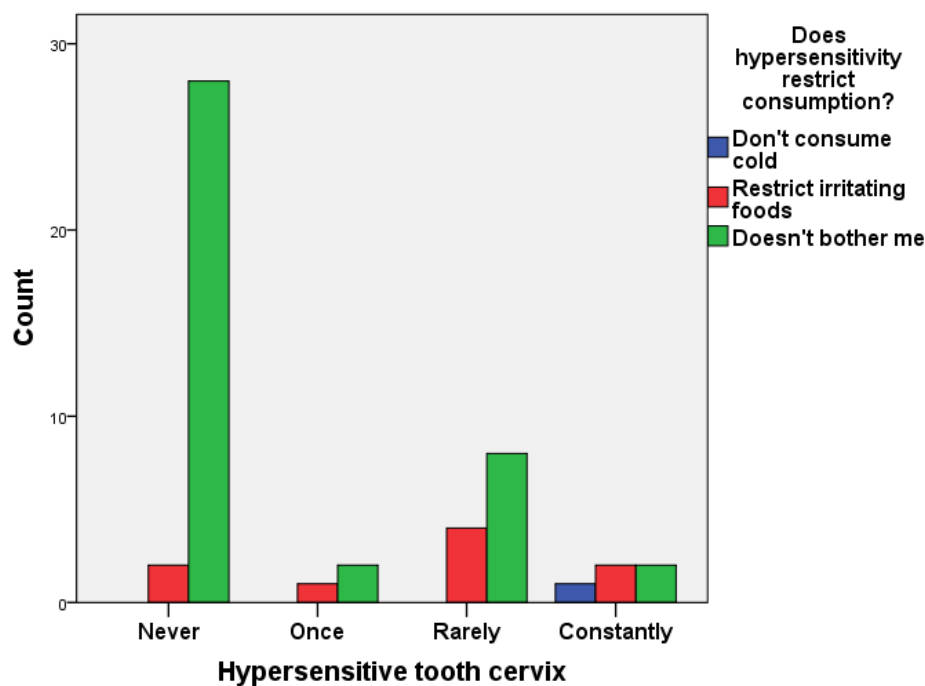


Figure 2: Use of desensitization tooth pastes in patients with DH.



**Figure 3: Consumption restriction in patients with DH**

The presence of hypersensitivity does not disturb the consumption of spicy food or cold drinks, on most of the cases (Fig.3). There is moderate negative correlation between these factors ( $\tau=-0.421$ ,  $p=0.002$ ).

## Conclusion

Dentin hypersensitivity is a clinically significant problem for a large number of people. Sometimes it affects the quality of life by limiting individuals in the consumption of certain foods and drinks and implementation of oral hygiene procedures. It is an imperative to increase the level of awareness for better understanding of the problem and its prevention by both, dentists and patients.

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