

ORIGINAL ARTICLE

A Cross-Sectional Study of factors associated with prevalence and progress of Dentin Hypersensitivity

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ABSTRACT

Aim: DHS is a prevalent dental disorder. Several variables affect DHS to analyze the problems prevalence and correlations.

Place of study: Dental College (HITEC-IMS), Taxilla

Duration of Study: February 2019 to August 2021

Methods: This cross-sectional investigation looked at 182 surgical dentistry patients at (HITEC-IMS) Dental College, Taxilla. Demographic and associated variables were accumulated from a survey and one examiner looked at clinical linkages. A visual analog scale was devised to categorize the results (VAS). Chi-Square test was used to examine the related factors at the significance level of 0.05.

Results: Described data is shown. The Chi-Square test was employed here with 0.05 for all variables. DHS was found in 26% of the cases. Hard toothbrushes, traumatic occlusion, gingival surgery history, and horizontal brushing ($P < 0.0002$, $P < 0.004$) are all associated with DHS ($P < 0.0004$).

Conclusion: According to the results, high awareness about DHS and its associated factors are mandatory for better prognosis.

Keywords: Hypersensitivity, DHS,

INTRODUCTION

DHS (dentin hypersensitivity) is a rather prevalent condition. Dentin hypersensitivity (DHS) results in a transient soreness. This type of discomfort is not caused by any other diseases or conditions. Eating, drinking, and maintaining good dental hygiene might be challenging while you are in discomfort. The hydrodynamic theory is the one that is most often accepted. It appears that environmental cues have an impact on tubular fluid flow. Baroreceptors detect changes in blood flow and interpret them as discomfort. Dentin tubules are covered by the enamel and cementum in the oral cavity. Gingival recession and wear, which include erosion, abrasion, and abfraction, are the primary causes of enamel and cementum loss. DHS, on the other hand, is a multifaceted problem. This is a complicated problem that has been thoroughly researched across a wide range of civilizations. Several investigations have been conducted to determine the causes of DHS, but no one has been able to determine why. Recognizing the underlying causes of the problem might assist to reduce DHS. As a result, the current study tried to determine the incidence of DHS in Pakistani communities as well as the factors that contribute to it.

MATERIALS AND METHODS

This cross-sectional study was conducted at the department of operative dentistry. The estimated sample size method was based on 182 samples, a prevalence of 8%, a threshold of statistical significance of 0.05, and a margin of error of 5% for the results. Patients who were referred to dentistry outdoor between February 2019 and August 2021 were counted within that time period. Participants in the study provided informed permission prior to participating. Patients who had recently used bleaching chemicals, were undergoing orthodontic treatment, or were unwell were among those who were barred from participating. In order to collect demographic and associated information, a questionnaire was used. The questions were prepared and asked by the researcher. The individuals were then assessed clinically by one of the researchers. The erosion, abrasion, and abfraction of teeth, as well as traumatic occlusion, were the reasons. These experiments did not include the use of cavities or direct or indirect restorations of

any kind. The temperature and pressure of the air-water syringe were both calibrated at a constant value. Four bars were displayed on a digital barometer. Using an infrared thermometer, all of the individuals got 12 degrees Celsius. Following the separation of the surrounding teeth, 1 cm of air was sprayed over the buccal and lingual surfaces of each tooth. The teeth were subjected to typical airflow for 8 seconds. The buccal and lingual surfaces of each tooth were scraped with the probe. The subjects were then asked to rate their level of discomfort on a 100-mm Visual Analog Scale (VAS). Here's how it all went down: Mild pain is defined as 5–40 mm, moderate pain as 41–70 mm, and severe pain as 71–100 mm.

The sensitivity of sensitive teeth is measured in millimeters (mm). This was accomplished through the use of SPSS (version 23). The frequency distribution, mean, and standard deviation were used to characterize the data (SD). The parameters were analyzed using the Chi-Square test with a 0.05 significance level.

RESULT

Table 1 indicates the prevalence of DHS as well as the risk factors associated with it. There were 58% males and 42% women in total. The data revealed that there was no link between gender and DHS ($P=0.6$). The ages of the participants varied from 18 to 55 years old. ($P=0.8$) There was no effect of age on DHS. Urban population is 60% and rural population is 40% in all samples. Total 46(25%) of the participants were smokers, Pan and Gutka users whereas 136 (75%) of the participants did not ($P=0.07$). Horizontal or vertical brushing was used by 61 individuals (33.52%), and both horizontal and vertical brushing were used by 121 people 66.48% ($P=0.004$). Normal tooth brushes were used by 76% (41.75%), whereas good quality toothbrushes were used by 106 people 58.24% ($P0.001$). Gingival recession and DHS were shown to be highly associated ($P0.001$). Gingival surgery was performed on 31 individuals (17.03%), while it was not performed on 151 persons (82.96%). The relationship between gum surgery and DHS is significant ($P0.001$). When it came to dental wear, 30 individuals 16.48% had it, whereas 152 (83.51%) did not; it was found to be associated with DHS ($P0.001$).

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Table 1: Demographical presentation of samples

Variables		With DHS	Without DHS	P-value
Gender	Male	32(68.08%)	74(54.81%)	0.6
	Female	15(31.91%)	61(45.18%)	
Age	<30years	36(76.59%)	88(65.18%)	0.8
	>30 years	11(23.41%)	47(34.81%)	
Social Background	Urban	30(63.83%)	80(59.26%)	0.7
	Rural	17(36.17%)	55(40.74%)	

Table 2: Prevalence and the Associated Variables

Variables		With DHS	Without DHS	P-value
Pan, Smoking& Gutka	Pan, Smoking & Gutka	14(29.78%)	32(23.70%)	0.07
	None of Above	33(70.21%)	103(76.30%)	
Brushing Technique	Non Standard (Horizontal or Vertical)	34(72.34%)	27(20%)	0.004
	Standard (combination)	13(27.65%)	108(70%)	
Toothbrush bristles	Normal Quality	38(80.5%)	38(28.15%)	0.002
	Normal Quality	9(19.15%)	97(71.85%)	
Gingival recession	With recession	19(40.46%)	12(8.88%)	0.001
	Without recession	28(59.54%)	123(91.11%)	
Tooth wear	Yes	16(34.04%)	14(10.37%)	0.001
	No	31(65.96%)	121(89.63%)	
Scaling	Yes	18(38.30%)	18(13.33%)	0.06
	No	29(61.70%)	117(86.66%)	

DISCUSSION

This study looked on the prevalence of dentine hypersensitivity (DHS) and related variables in Pakistan. DHS is a common dental ailment that affects many people. The impact of a wide range of variables on the prevalence of this illness has been researched in great detail. Dental wear (erosion) is one of the factors that contribute to dentin exposure and the possibility of DHS. Aging and periodontal disease can result in the loss of periodontal tissues and the cement that surrounds the teeth, resulting in the formation of DHS. According to the findings of this study, the prevalence of DHS in the general population is 21%. *Bamise C.T* et al. reported a prevalence of DHS of 26%, which was consistent with our findings. *Rees JS* and colleagues discovered a 36% occurrence rate during their analysis. The documented dental hygiene disparities in the current analysis may have been influenced by factors such as dental hygiene, economic situations, and educational levels, to name a few. According to *Cunha-Cruz et al.*, DHS affects 14% of the population in the Pacific Northwest of the United States. Similarly, *Rees* discovered a frequency of 4.1% in the United Kingdom (UK). The degree of dental treatment received, the frequency with which dental appointments are made, as well as other environmental and cultural variables, can all contribute to the variation in DHS prevalence among countries. According to research, the prevalence of DHS varies between urban and rural settings. Because of the observed discrepancies, it is vital to investigate the root causes of DHS. DHS is shown to be higher in females, according to *Udoye's* research. According to the findings of the current study, there is no relationship between DHS prevalence and gender. Although education was included in this investigation, *Gillam DG et al.* discovered that those with less education had higher levels of DHS. Examples include *Gillam DG et al* study's which found that the prevalence of dental caries reduces with age, presumably due to sclerotic dental enamel and lower dental permeability. In contrast to *Alcântara et al.*, this study revealed no association between age and the prevalence of DHS. Other studies have found that the prevalence of DHS increases between the ages of 28 and 32, 42 to 52, and 53 to 58 since the ages of the individuals varied. Premolars and canines had higher levels of DHS, according to the study. Premolars have a greater DHS frequency than other teeth, according to similar research. As a result of more rigorous tooth cleaning, the dentin becomes more exposed, increasing the risk of gingival recession and hard tissue loss surrounding the teeth. In one investigation, the anterior and posterior teeth of the mandible were discovered. Other studies have found that these teeth are the most sensitive, because the

enamel on these teeth is thinner. *Bekes Kand* colleagues discovered that using hard brushes and brushing horizontally enhanced tooth sensitivity. Several studies have demonstrated that gingival recession is the most common cause of DHS, which is also what we discovered. This study found a relationship between gingival recession and DHS. Dentine tubules become hypersensitive when they are exposed to a variety of stimuli in the oral environment. Because of this, *Rees* discovered that people with periodontal disease were more likely than the general population to have DHS. This demonstrated that the two conditions are related. *Alcântara et al.* state that the lack of hard tissue protecting the teeth causes the dentin to be exposed. One of the most prevalent causes of gingival recession is misaligned teeth as a result of orthodontic treatment.

Teeth that are not properly aligned cause gingival recession, which is accelerated by plaque. Plaque contains toxins that promote structural degeneration of the tooth and eventually dentin exposure. *Alcântara et al.* also discovered a strong association between traumatic occlusion and hypersensitivity in their research. Occlusal damage causes teeth to flex. Cervical enamel loss, dentin exposure, and DHS are all facilitated by the weaker enamel crystals. According to the findings of this study, dental wear, particularly erosion, is now recognized as a significant risk factor for DHS. Fluctuations in hydrolytic pressure and other co relating factors were studied by *Haneet and Vandana*. Understanding the underlying causes of the problem may assist to reduce DHS.

CONCLUSION

According to the findings of the study, 21% of the population suffers from DHS, with the mandibular first premolar being the most often impacted tooth. Gingival recession, hard toothbrushes, horizontal brushing, occlusal stress, dental wear, and gingival surgery are all variables that increase the risk of developing DHS. Further study with more than one examiner and a nationwide study sample size will give a more focused outlook to the underlying causes of DHS and thus its management.

Conflict of interest: Nil

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