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ORIGINAL ARTICLE

Dentine Hypersensitivity: A cross-sectional study in Karachi

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ABSTRACT

Aim: To assess the awareness of dentinal hypersensitivity among the patients visiting dental outpatient department at KMDC hospital, Karachi.
Methodology: The data for this cross-sectional study was collected from 361 patients visiting dental OPD of Karachi Medical and Dental College, Karachi. After informed consent, a close ended type questionnaire was filled and patients were examined for dentin hypersensitivity. The data obtained was analysed using SPSS version 22.
Result: Out of total participants, 40% male and 21.5% female significantly respond to dentin hypersensitivity (p-value 0.001). Dentin hypersensitivity was higher in males than in females .40-50 age group was more commonly affected and cold stimuli was the most common aggravating and initiating factor found. In addition to it, Aggressive tooth brushing and grinding are the main etiological factors for dentin hypersensitivity.
Practical implication: This study may help to clearly understand the prevalence and associated risk factors of dentine hypersensitivity to develop effective and appropriate treatment.
Conclusion: It is necessary to organize public awareness programmes regarding adequate brushing technique, good oral hygiene, avoidance of abrasive as well as erosive agents and counselling the dietary habits to prevent dentin hypersensitivity.
Keywords: Personal awareness, dentin hypersensitivity, hydrodynamic theory, public awareness, aetiology, erosion

INTRODUCTION

Dentin hypersensitivity is a sensation felt when the nerves inside the dentin are exposed to the external environment[1]. It is one of the common clinical finding ranges from 2.8% to 98%[2]. These sensations can extend from vexation all the way to the intense shooting pain. The pain is characterized as sharp and of short duration, arising in response to stimuli; such as heat, pressure, temperature, fluid movement, chemical or electrical and that cannot be ascribed to any other dental disease[3]. Dentin hypersensitivity can be caused by various factors including tooth wear, gingival recession, pocket formation, abrasion, erosion, attrition, abfraction, overzealous tooth brushing, decay teeth or exposed tooth root surfaces[4]. However among them the most commonest reported triggering factor is cold as majority of the patients with dentinal hypersensitivity visit with complaint of pain upon cold stimulus[5]. It is stated that the most acceptable theory is the' hydrodynamic theory' proposed by Brannstrom and Astron suggests that the pain is felt by the movement of dentinal fluid within the tubules (outside and inside movement) that mechanically disturbs the nerves[2].

According to the scientific consensus about 10% to 30% of the universal population is suffering from this condition[6]. Several studies throughout the world reports that dentin hypersensitivity is one of the most painful condition that is more common and covering 71% of adult population[7]. It has been reported that out of 40 million people in the US, about 30% of the adults are encountered with dentin hypersensitivity[6]. Furthermore, researches have been evidenced concluding that dentinal hypersensitivity is being more prevalent among adult population ranging from 25% to 40%8,9[8.9]. These variations are due to several reasons, including different study designs, variation in the consumption of carbonated drinks and erosive foods, oral hygiene, brushing habits, diagnostic approaches and the type of setting where the study was performed[7].

To identify various risk factors and to implement the most effective preventive measures, further epidemiological studies are required. Few studies have been conducted in Pakistan on dentin hypersensitivity epidemiology, a study conducted at Lahore reported 22% prevalence and in Karachi showed 36.4% prevalence[10,11]. However, scarce literature present on the prevalence with clinical features and associated aggravating and risk factors of dentin hypersensitivity in the population of Pakistan.

Dentin hypersensitivity is a persistent clinical problem that poses significant challenge for clinicians and affects patients' quality of life. Better understanding of the dentin hypersensitivity burden and its associated factors can assist on resource planning for reducing/preventing any discomfort arising from this condition and will aid in the decision-making process. Many authors agreed with the fact that this was a common problem that was either under-reported or misdiagnosed[2]. To choose and develop effective and appropriate treatment it is necessary to clearly understand the associated risk factors with prevalence of this condition.

Therefore, we conduct this study to determine the frequency with associated factors of dentin hypersensitivity among the patients visiting dental OPD at KMDC and Ziauddin University.

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MATERIALS AND METHODS

This cross-sectional study was conducted from the patients visiting the OPD at Karachi medical and dental college, and Ziauddin University Hospital, Karachi. The duration of the study was 6 months. Verbal informed consent was taken, followed by clinical examination. DH was diagnosed by cold air blast using triple syringe for 5 seconds and a close ended type multiple choice based questionnaire was given to each participant. The response of each subject was recorded through Schiff sensitivity scale as: no response (0), respond to air stimulus but does not require withdrawal of stimulus (1), respond to air stimulus and request withdrawal of stimulus or moves from stimulus (2) and subject responds to air stimulus, experiencing pain and request for stimulus removal (3). The sample size consisted of 361 patients. The sample size was calculated by the formula,

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

The sample was grouped on gender and age basis.
Age group: 20-30
31-40
41-50
51-60
Gender: Female / Male

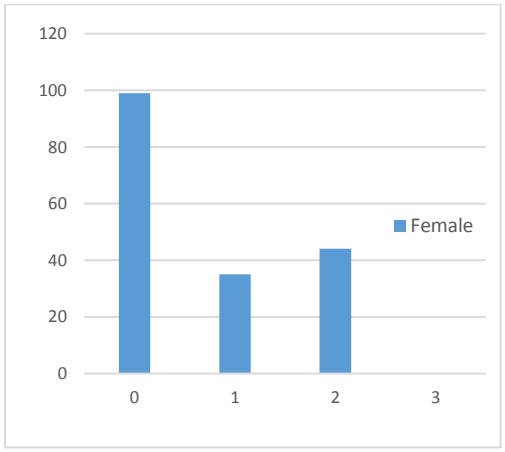
Inclusion criteria consisted of all vital sound teeth. Carious, cracked or restored teeth, abutment teeth for removable or fixed prosthesis and tooth with any other dental pathology will be excluded. Patients using analgesics, mood alteration medications, teeth whitening agents in the last six months or undergoing orthodontic therapy will be excluded.

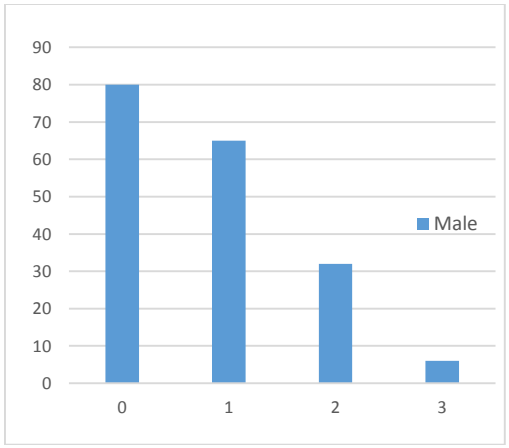
Statistical Analysis: The data was analysed on SPSS version 22. Chi square test was applied to determine the association. A p-value less than 0.05 was considered as statistically significant.

RESULT

Figure 1 represents the Schiff score estimated in 361 participants. In females almost 100 participants showed no response whereas in males 80 participants showed no response. However, in male's majority scores 1 compared to females. Schiff score in both male and females showed significant result with p-value of 0.001.

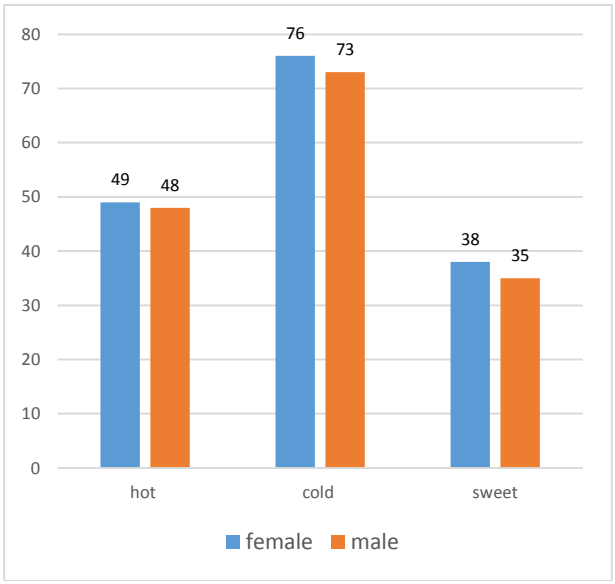
Figure1: Schiff score as 0 (no response) 1 (respond to air stimulus but does not require withdrawal of stimulus) 2 (respond to air stimulus and request withdrawal of stimulus or moves from stimulus) 3 (subject responds to air stimulus, experiencing pain and request for stimulus removal) in male and females. Chi-square was applied.





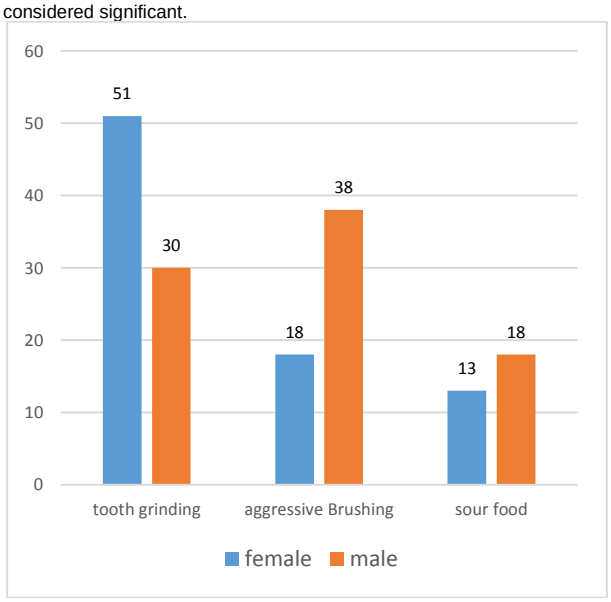
Aggravating Factors of Dentin Hypersensitivity: The aggravating factors of dentin hypersensitivity including hot, cold and sweet foods stimulus was associated with gender and showed cold stimulus to be highest in males and females. However, no significance was observed in association with Hot stimulus (p-value 0.43) and with cold stimulus (p-value 0.33). Whereas, sweet foods showed significant association (p-value 0.03) as shown in figure 2.

Figure 2: Represents the aggravating factor of dentin hypersensitivity in males and females. Chi-square was applied-value of less than 0.05 considered significant.



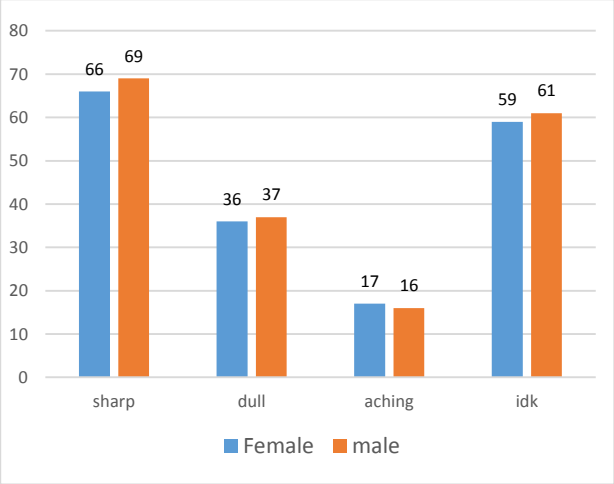
Association of Etiological Factors: To determine the association of etiological factors of dentin hypersensitivity, chi square test was applied. Among all the factors teeth grinding was the most common habit found in females whereas aggressive brushing in males. Statistically significant results were observed on association of teeth grinding and brushing habits (p-value 0.004). However, sour food consumption didn't show any significance (p-value 0.22) as shown in figure 3.

Figure 3. Represents the etiological factors of dentin hypersensitivity in males and females. Chi-square was applied-value of less than 0.05 considered significant.



Association of Intensity of Pain in Dentin Hypersensitivity: The pain intensity was categorized as dull, sharp, aching pain and participants that doesn't recognize pain intensity as shown in figure 4. Majority of dentin hypersensitivity patient experienced sharp pain. The pain intensity showed no significant association with gender (p-value 0.9).

Figure 4. Represents the pain intensity as sharp, dull, aching and participants experiencing no pain (idk) in males and females. Chi-square was applied-value of less than 0.05 considered significant.



Prevalence of Dentin Hypersensitivity: The prevalence of dentin hypersensitivity was determined in male and females visiting dental OPD of KM&DC. It was estimated to be 21% in females and 40% in males with p-value of 0.001as shown in figure 5 A. It was associated with the age groups and was found to be significantly higher in age between 40-50 years (p-value 0.001) as shown in figure 5 B.

Figure 5A: Represents the prevalence of Dentin Hypersensitivity in males and females. Chi-square was applied-value of less than 0.05 considered significant.

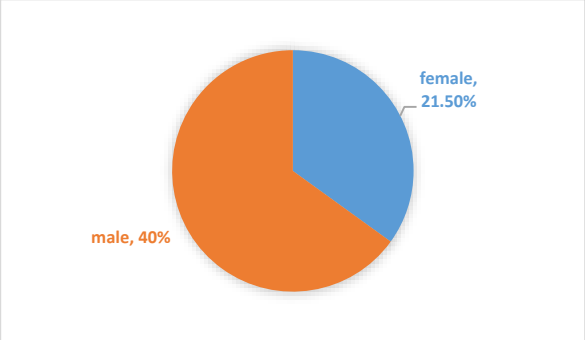
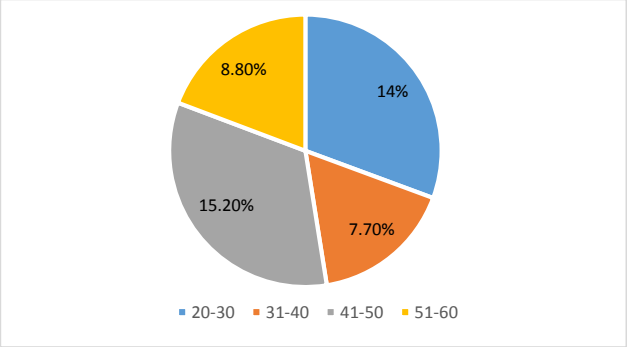


Figure 5B. Represents the association of Dentin Hypersensitivity with age groups. Chi-square was applied-value of less than 0.05 considered significant.



DISCUSSION

Dentin hypersensitivity is among the commonest concern that may interrupt the patient during their everyday life activities. This unpleasant sensation causes nutritional deficiency as well as complete annoyance in the affected individuals[12]. The pain causes them to develop new habits like avoiding cold food and drinks, avoid eating from the affected side, all this may add up and becomes more stressing to the affected one and disturbs their quality of life.

In our study, the prevalence was reported to be 40% in males and 21.5% in females. In Hong Kong, a hospital based study showed (68.4%)[13]. Some reporters showed high pervasiveness of dentin hypersensitivity, such as in India (males 55% and females 42.5%)[8]. In Nigeria (males 52.8% and females 63.3%)[14]. The higher values of dentin hypersensitivity are may due to the negligence of oral health. Especially in the developing countries, the prevalence of dentin hypersensitivity is high ,may due to the lack of awareness and they usually try to avoid the stimulus rather than taking the treatment[15].

This study shows that in 40-50 age group of population, dentin hypersensitivity is more prevalent. On contrary, Hegde et al conducted the study in South canara showed 20-40 years' age group had highest prevalence[8]. A study conducted at Dow university in Karachi in 2019 shows the same result[10]. This age group population is affected the most may be because with time ,the regenerating and repairing capacity of human dental tissues starts to decrease. With aging dentin becomes more sclerotic, therefore reducing the hypersensitivity in elderly population[11]. However some studies showed the higher prevalence of hypersensitivity in 50-59 years age group[16]. 30-39 years of age[17]. 18-27 age group[18]. The reason for variation in prevalence of Dentin hypersensitivity might be due to the effect of several habits in a population that aggravates and progresses the condition.

Moreover, in terms of aggravating and etiological factors, Cold stimulus was the most common aggravating factor in our population. Whereas teeth grinding and aggressive brushing found to be the most common habit. Grinding of teeth leads to the attrition whereas aggressive brushing and sour food intake leads to abrasion, erosion and abfraction of tooth. According to Chrysanthakopoulos, gingival recession, one of the causes of DH, is linked to the horizontal brushing technique when used once day using a toothbrush with medium-hard bristles[19]. In addition to arguing that DH is a tooth-wear phenomenon[20], Addy backed up the evidence that there is probably a connection between brushing your teeth (with or without toothpaste and with or without an acidic diet) and both tooth wear and DH. It is plausible to infer that brushing regularly causes a large amount of subclinical gingival irritation, abrasion, and early exposure of cervical dentin, which can result in DH[21].

The average participants of this study showed sensitivity in multiple teeth, with most commonly affecting teeth were incisors. Other studies showed the similar results[22]. The highest frequency in incisors might be due to the fact that these teeth shows more gingival recession than others[23].

CONCLUSION

It was concluded that the frequency of dentin hypersensitivity in the patient visited the dental OPD at KMDC was 40% in males and 21.5% in females. In this study 40-50 age group was the most affected group and cold stimulus was the common initiating and aggravating factor. Hence, it is necessary to organize public awareness programmes regarding adequate brushing technique, good oral hygiene, avoidance of abrasive as well as erosive agents and counselling the dietary habits to prevent dentin hypersensitivity.

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