ORIGINAL ARTICLE

DENTINE HYPERSENSITIVITY THE MOST NEGLECTED DENTAL ISSUE

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ABSTRACT

The objective of this study is to determine the epidemiology, predisposing factors and aetiological factors for Dentine hypersensitivity in the order to develop ideas for more realistic prevention and management strategies.

A questionnaire based survey was conducted from March 2019 to September 2019 among Medical, Dental & DPT students of Shahida Islam Medical and Dental College Lodhran. The study population for the survey consisted of 500 students of mean age group (22yrs), included both males and females after informed verbal consent.

Out of 500 people 286 were positive for hypersensitivity that is 57.2%. The most frequent cause of hypersensitivity was due to cold beverage only, occurring in 206 people that is (72%). Rest of the 81 people constituting 28% had hypersensitivity due to multiple causes. 43 that is 15% people have hypersensitivity to cold beverage, tooth brushing and sweet. The remaining 38 people making 13% were found to have hypersensitivity to hot and cold beverages. Desensitizing tooth pastes were used by 67.9% of those reporting sensitivity. The majority of these (72.6%) confirmed improvement in their symptoms reporting a beneficial effect. Professional treatment had been sought by 32% of subjects, almost all (91%) reporting an improvement post-treatment. Dentine hypersensitivity was more commonly found in females than males. There was no significant correlation in the level of reported sensitivity and previous periodontal treatment. The commonest teeth affected were the lower incisors distribution being buccal cervical areas of canines and first premolars. Least commonly found sensitive teeth were molars.

Dentine hypersensitivity is a relatively common problem experienced by general population. This condition may disturb during eating, drinking, brushing and sometimes even breathing. Many remains unknown about dentine hypersensitivity, even the terminology can be questioned.

Keywords: *Dentine hypersensitivity, diet, gingival recession, oral hygiene, tooth brushing and tooth wear.*

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INTRODUCTION

Dentine hypersensitivity is a sudden onset of pain as a response to cold, hot, sour and sweet. This condition may disturb the patient during eating, drinking, brushing and sometimes even breathing[1,2]. Tooth hypersensitivity, or more precisely dentine sensitivity or hypersensitivity, is described clinically as an exaggerated response to non-noxious stimuli and satisfies all the criteria to be classified as a true pain syndrome.[3] By definition, dentine hypersensitivity may arise as a result of loss of enamel and or root surface denudation with exposure of underlying dentine. Enamel loss as a part of tooth wear may result from attrition, abrasion or erosion. Although tooth wear has usually been divided into attrition, erosion and abrasion, in reality it is a combination of these but often with differing proportional effects. Attrition describes the wear of teeth at sites of direct contact between teeth.[4] Attrition is associated with occlusal function and may be exaggerated by habits or Para functional activity such as bruxism. Thus bruxism was found to be the sole cause

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of pathological tooth wear in 11% of referred tooth wear cases and was a contributory factor in two-thirds of the combined aetiology cases.[5] Abrasion describes the wear of teeth caused by objects other than another tooth,[4] toothbrush/toothpaste. Typical toothbrush abrasion lesions are side dependent, for example being greater on the left-side in right-handed people. The buccal cervical area of the teeth is the site of predilection. Furthermore, canines and premolars are most affected because of their position within the dental arch where they receive the most attention during tooth cleaning.[6] The toothbrush itself has little or no effects on dental hard tissues.[7] Even toothpaste on a toothbrush alone causes almost no enamel abrasion and only clinically insignificant effects on dentine. However when combined with erosive agents tissue loss from tooth brushing with toothpaste is increased enormously.[8] Incorrect tooth brushing appears to be an aetiological factor in dentine hypersensitivity. Instruction in proper brushing technique can prevent further loss of dentine and the resulting hypersensitivity. Excessive force, hard toothbrushes, highly abrasive toothpastes should be avoided. The use of none or low abrasive dentifrices or brushing with water resulted in closure of dentinal tubules, while brushing with a dentifrice containing calcium hydrogen phosphate as an abrasive system lead to opening of the dentinal tubules.[9] Other causes of Dentine hypersensitivity are oral prophylaxis, Bleaching or tooth Whitening, post-op periodontal procedures. Some of the strategies which could be helpful for the management of dentine hypersensitivity is a detailed dietary history and clinical examination.[10,11] The condition should be differentiated from other causes of dental pain which could cause similar dentinal symptoms.[3] Although it has been suggested that true hypersensitivity can develop as a result of pulp inflammation.[12,13] the symptoms are thought to be more severe and persistent than the typical short sharp pain of dentine hypersensitivity. Conditions that can produce symptoms mimicking those of dentine hypersensitivity are cracked tooth , fractured restorations, chipped teeth, dental caries, post-restorative sensitivity, and teeth in acute hyperfunction.[14] Patients generally complain that pain arising from dentine hypersensitivity is usually rapid in onset, sharp in character, and short in duration.[15] More rapid response to stimuli or the persistence of pain after removal of the stimuli have been ascribed to inflammatory changes in the pulp.[16]

Identifying and managing etiological and predisposing factors is always recommended. In case of mild-to-moderate sensitivity, at home desensitizing therapy should be advised. Recommendation of a desensitizing agents such as GC -Tooth mousse and desensitizing tooth pastes. These tooth pastes contain potassium oxalate[17], sodium monofluorophosphate, sodium fluoride, stannous fluoride, strontium chloride[18] etc. Which percolates inside the dentinal tubules to cover or plug them or forms precipitates. The topical application of the tooth paste directly onto sensitive cervical dentine just before retiring (without post application rinsing or expectoration) is also frequently cited as beneficial. Some improvement for a majority of cases will be obtained by desensitizing tooth paste. If there is no relief or in case of severe sensitivity, initiate in-office treatment. In office professional fluoride applications, gels & fluoride varnishes provide relief of limited duration and recall appointments should be arranged for bi-annually or quarterly applications depending on the customized patients' needs. Lasers, Gluma, gluteraldehyde, desensitizers or dentine bonding agent. Resins or other materials which bond to dentine and are resistant to wear are recommended. When there is a significant loss of cervical tooth structure, use of restorative materials such as glass ionomer cement (GIC),nano structure bioactive glass[19] and composite resins is helpful in severe cases. In extreme cases, endodontic or periodontal therapy can be initiated. Regular review and reinforcement of the preventive aspects of management, patient's guidance and further plans to address the problem. If persistent DH further investigations must be ordered and advanced treatment might be required in very few cases such as graft surgeries. Periodontal surgeries such as free gingival grafts (FGG), lateral sliding grafts, connective tissue and coronally repositioned flaps can be performed to cover the exposed roots in the cases of gingival recession or furcation involvement.

MATERIAL AND METHODS

The study population for the survey consisted of 500 students, between 20 and 24 years of age, both males and females after informed verbal consent. A questionnaire based survey was conducted from March 2019 to September 2019 among Medical, Dental & DPT students of Shahida Islam Medical and Dental College Lodhran. Self-administered questionnaire starting with personal information such as name, age, gender, boarders / day scholars and permanent address. The questionnaire consisted of 20 questions to gather information relevant to dentinal hypersensitivity. The main focus was on diet plans, eating habits and oral prophylaxis methods followed by the students in routine. The questionnaire had questions regarding self-reported dentinal hypersensitivity, opinion regarding the relationship of dentinal hypersensitivity and oral prophylaxis, various triggering factors, the presence of systemic diseases, beverage consumption per day, Para functional habits, methods of oral hygiene maintenance, previous dental visits and treatment taken.

RESULTS

Out of 500 people 286 were positive for hypersensitivity that is 57.2%. The most frequently cause of hypersensitivity was due to cold beverage only occurring in 206 people that is (72%). Rest of the 81 people constituting 28% had hypersensitivity due to multiple causes. 43 that is 15% people have hypersensitivity to cold beverage, tooth brushing and sweet. The remaining 38 people making 13% were found to have hypersensitivity to hot and cold beverages. Desensitizing tooth

pastes were used by 67.9% of those reporting sensitivity. The majority of these (72.6%) reporting a beneficial effect. Professional treatment had been sought by 32% of subjects, almost all (91%) reporting an improvement post-treatment. Dentine hypersensitivity was more commonly found in females than males. Surprisingly there was no significant correlation found in the level of reported sensitivity and previous periodontal treatment. The commonest teeth affected were the lower incisors followed by canines and first premolars on their buccal cervical surface. Least sensitive teeth were molars.

The commonest initiating factor was cold drink. Significantly greater proportions of left side tooth sensitivity compared with their right contralateral tooth types. The results indicated that self-reporting of Dentine Hypersensitivity is lower and less identified by younger age groups. Though it affected the life style but it was not perceived as a major dental problem by most individuals or may be more neglected dental issue among population.

DISCUSSION

Dentin hypersensitivity is a neglected problem and its prevalence is at a rise among adult population especially in female and its intensity varies from individual to individual. Main reason is exposure of dental tubules as a result of loss of enamel and cementum. Dentin hypersensitivity hampers the daily routine activities of patients.[28] It causes difficulty in eating, drinking, brushing and even breathing in cold environment.[20,21] Enamel loss as a part of tooth wear may result from attrition, abrasion or erosion. Amarasena N, Spencer J, Ou Y et al concluded their research and found that recessed gingiva, followed by the abrasion,erosion, attrition lesions and bruxism were the most commonly contribute to DH in this sequence.[22]

Beenish F A, Umaima K, Nabeela A. et al in their study on DH confirmed that the problem lies more in females as compare to males and in addition people are prone to develop DH due to the consumption of cold food and fizzy drinks than anything else.[23]

Enamel covers the dentine in the crown region while the roots of the teeth are concealed in the soft tissue around it called peridontia both forming a protective layer against tooth wear. Whenever these protections are breached due to trauma, hard brushing, recession of gums this results in dentine hypersensitivity. Hakan C, Ayl□kc□ BU, Hamidi MM et al in their article noticed that about 51.6% people had DH due to hard tooth brushes and imperfect technique. Sensitivity due to consumption of cold beverages was identified as the most common cause which was around 69% and it is near to our statistics of 72%.[24]

Rees JS, Jin LJ, Lam S, Kudanowska I. et al found that the dentine hypersensitivity occurred predominantly in the premolars (49•6%), followed by the anterior teeth (30•5%). A total of 84•3% of dentine hypersensitive patients had gingival recession. The

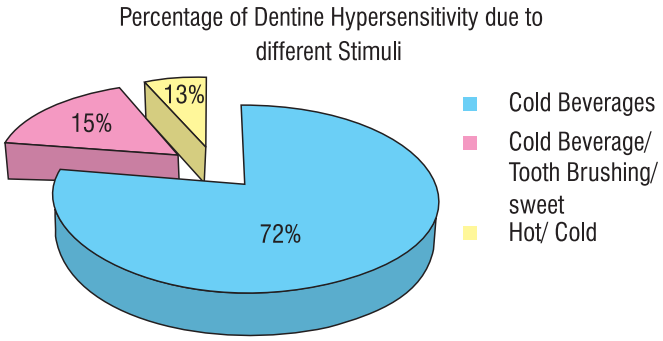

Fig 1: The Prevalence of Reported Dentinal Hypersensitivity due to different stimuli.

TABLE 1: SUMMARY OF REPORTED NUMBER OF PATIENTS & PERCENTAGE WITH DENTINAL HYPERSENSITIVITY DUE TO DIFFERENT STIMULI.

Sensitivity	Number	Percentage
Cold	206	72%
Cold/ Tooth Brush/ Sweet	43	15%
Cold / hot	38	13%

prevalence of dentine hypersensitivity noted was 34.1%, indicating that it is a common condition. In our study the commonest teeth affected were the lower incisors followed by canines and first premolars on their buccal cervical surface while least sensitive teeth were the molars.[25]

Nicola X W, Mariano S, Adrian L. et al in their study reported that significant associations were found between clinically elicited DH and erosive tooth wear and gingival recession in addition there was a marked association between DH and risk factors including heartburn/acid reflux, vomiting, sleeping medications, energy drinks, smoking and acid dietary intake. Inhaled medication, tooth whitening and swimming in chlorinated pools also cause dentine hypersensitivity.[26]

In our study desensitizing tooth pastes were used by 67.9% of those reporting sensitivity. The majority of these (72.6%) reporting a beneficial effect. Different commercially available desensitizing toothpaste are available that effectively lowers the sensitivity. Mostly they are composed of, sodium fluoride, potassium oxalate, stannous fluoride, sodium monofluorophosphate, strontium chloride, etc. they simply flow in and clog the dentinal tubules. Chen L, DingIn P, Dai A et al stated that hypersensitivity caused by non-surgical periodontal therapy can be alleviated by home use of nano carbonate apatite dentrifice (n-CAP).[27] Persistent cases, and in patients with significant loss of cervical tooth structure, restoration with composite resins or glass ionomer cement (GIC) are very beneficial. Periodontal procedures for covering the root exposures i.e. free gingival grafts (FGG), connective tissue and coronally repositioned flaps and lateral sliding grafts are recommended. Alternatively endodontic treatments

can also be suggested and in most resistant cases extraction is left as a final treatment plan.

CONCLUSION

The greatest clinical implication of dentine hypersensitivity is how the condition may be prevented either from occurring or recurring, and this can only be debated by considering the probable aetiologic factors. There is a need for greater professional and thereby public health awareness, through education, elimination of the causes, modification of diet plans ,adaptation of correct methods of tooth brushing, effects and prevention of tooth wear and gingival recession. Encouragement for regular dental check-up and regular consultation of Dental expert to improve dental health and thus improve quality of life.

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3 Bushra Ghani:	Data collection, data analysis and interpretation. Accountable for all aspect of the work.
4 Amir Ali Khan:	Helped in organizing data, software management, data collection, analysis and interpretation. Doing corrections. Accountable for all aspect of the work