Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-8, Issue-6 | November- December 2022
DOI: 10.53339/aimdr.2022.8.6.5
Page no- 31-37 | Section- Research Article (Periodontics)

Evaluation of Dentine Hypersensitivity in Adult Population with Chronic Periodontitis Visiting Government Dental College & Hospital, Srinagar

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Received: 05 August 2022
Revised: 29 September 2022
Accepted: 13 October 2022
Published: 22 October 2022

Abstract

Background: A working knowledge of the prevalence of hypersensitivity in chronic periodontitis patients, is imperative to adequate prognostication, treatment planning and outcome. The present study, is a primary report of the prevalence of dentinal hypersensitivity, in relation to various patient characteristics (demographic and clinical) in chronic periodontitis patients visiting Government Dental College and Hospital, Srinagar, J&K. **Material & Methods:** A cross-sectional study design was used to evaluate 100 male and 100 female patients diagnosed with chronic periodontitis both by questionnaire and clinical test for the presence of dentinal hypersensitivity, in relation to various features. **Results:** An overall prevalence of 34% was found for self-reported and 42 % for actual dentinal hypersensitivity in chronic periodontitis patients. It was highest in females, undergraduates, rural subjects and canine teeth. The most common provoking stimulus was cold, and duration of hypersensitivity was less than 6 months. Clinical attachment loss was found to be more often associated with hypersensitivity than clinical gingival recession.76% of the patients reporting hypersensitivity also reported the use of desensitizing toothpaste. The reported prevalence of hypersensitivity was in concordance with other reports from dental college clinics. The particular geo-social background of the study location could have contributed to the observed difference in precipitating factors, effect of diet, and treatment seeking behaviour. **Conclusion:** The prevalence of dentine hypersensitivity in chronic periodontitis patients was 34% according to questionnaire and 42% according to the results of clinical test. Periodontal attachment loss was found to be could be an earlier indicator or a possible risk factor of DH, indicating the need for clinical initiative in the management of hypersensitivity in chronic periodontitis patients.

Keywords:- Dentinal hypersensitivity, chronic periodontitis, gingival recession.

INTRODUCTION

Dentinal hypersensitivity refers to " short, sharp pain arising from exposed dentine response to stimuli typically thermal, evaporative, tactile, osmotic, or chemical, and which cannot be ascribed to any other form of dental defect or disease."[1] In chronic periodontitis patients, periodontal attachment loss may lead to exposure of the sensitive root

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surface into the oral cavity, and precipitate dentinal hypersensitivity. In addition, both surgical and nonsurgical therapy for chronic periodontitis may initiate or exacerbate root sensitivity in these predisposed patients.[2] Therefore, the treating periodontist should be able to anticipate and manage this obnoxious condition effectively, to maintain treatment standards and patient satisfaction.

In this purview, a working knowledge of the prevalence and relative distribution of dentinal hypersensitivity and associated risk factors in chronic periodontitis patients is an essential prerequisite for effective management. Unfortunately, contemporary scientific literature is profoundly deficient in this regard, with population specific data being most scarce.[3]

Therefore, the aim of the present study was to estimate the prevalence of Dentinal Hypersensitivity (self reported and actual) in chronic periodontitis patients visiting Government Dental College & Hospital, Srinagar. Secondarily, the study was also aimed to investigate the relationship between various demographic factors and Dentinal Hypersensitivity.

MATERIAL AND METHODS

The study was carried out in the Department of Periodontics, GDC, Srinagar, with prior institutional ethical clearance. Of the patients visiting the OPD, 100 male and 100 female chronic periodontitis patients were included based on the following criteria:

- Subjects of age 20–69 years and in good general health
- The subject should be available during the course of the study
- Minimum of twenty natural teeth excluding third molars.

Patients were excluded based on a history of allergies, diabetes mellitus, hypertension, any disease requiring analgesic drugs, tranquillizers, or mood-altering medication, a history of phase 1 therapy in the past 3 months, acute dental problems, undergoing orthodontic therapy, and patients using both home care and in-office desensitizing agents within the past 6 months. Moreover, teeth with any of the following conditions were not included in the study: Root-filled teeth, crowned teeth, abutment teeth for dentures and bridge work, teeth with marginal restorations interfering with dentine hypersensitivity evaluation, teeth with caries, attrition, erosion, abrasion, and abfraction. Informed consent was obtained from all recruits.

The investigation was carried out in the form of a DH questionnaire -DH(Q) followed by a DH clinical examination- DH(C). All patients were clinically examined for DH regardless of their response to questionnaire. Informed consent will be obtained from all recruits.

Questionnaire and clinical test

Questions about DH was read to the subjects and answers were recorded by the same examiner. Subjects who reported having hypersensitivity symptoms in the questionnaire were further diagnosed by a blast of air from a triple syringe, at a pressure of 60 psi under room temperature of about 20–25°C. A 10 cm horizontal VAS was used with the anchors designated as “no pain” and “severe pain”. The

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patients' personal perception of the severity of pain was characterized as "no discomfort" or "discomfort".

Clinical Parameters

Attachment loss and gingival recession was measured on sensitive teeth, using a 1 mm Williams graduated periodontal probe on all six sites of a tooth.

Data processing and statistical analysis

Categorical variables were presented as number and percentages. Chi-square test or Fisher's exact test was used for comparison between genders and age groups with or without DH. A 95% level of significance, i.e., $P \leq 0.05$ was considered statistically significant.

RESULTS

Out of the 200 patients examined for the study, 68 reported hypersensitivity symptoms in the questionnaire, yielding an overall prevalence of 34 %. With regard to genderwise prevalence, 38 females and 30 males had self reported dentine hypersensitivity ($P = 0.023$) [Figure 1] showing that the prevalence of hypersensitivity is significantly higher in females.

The greatest number of subjects reporting dentine hypersensitivity symptoms was found to be in 50-59 years age group , followed by 20–29 years age group. The least number of subjects reporting dentine hypersensitivity was in the 60–69 years age group [Table 1].

With regard to demographic parameters, undergraduate females, and subjects residing in the urban areas showed the highest prevalence of self reported hypersensitivity. There was no significant difference between vegetarians and non vegetarians. Most commonly, hypersensitivity was reported to last as long as the stimulus, and presented a history of less than 6 months [Table 1].

In this study, the most common provoking stimulus for hypersensitivity was found to be cold, followed by sweet [Figure 3].

All 200 patients were tested clinically for the presence of dentinal hypersensitivity, whereupon, 84 patients were found to have actual hypersensitivity, yielding an overall prevalence of 42%. Of these, 59 were females and 25 males, resulting in a male: female ratio of 2.36.

A total of 5035 teeth were evaluated, out of which 2076 teeth exhibited dentinal sensitivity on clinical examination. Statistically significant frequency of hypersensitivity was found in females, subjects of 40-49 age group, and canine teeth [Table 1, Figure 4].

All of the 2076 teeth showing hypersensitivity, also presented with attachment loss, whereas out of these, 38% also showed clinical recession [Figure 5].

Out of the 132 patients reporting with hypersensitivity, 100 had used some desensitizing agent. Of these, 65 were females and 35 males.

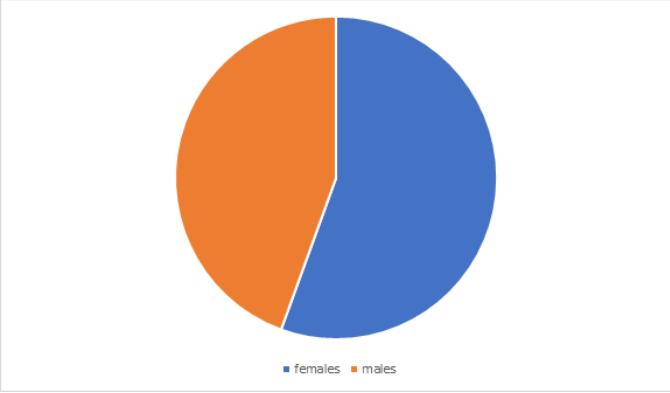

Figure 1: Genderwise distribution of subjects as per questionnaire

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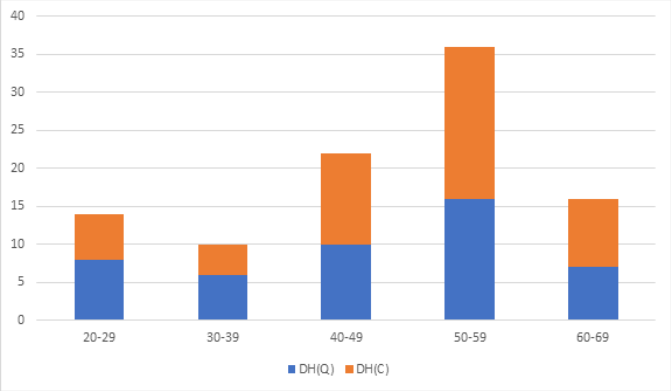

Figure 2: Prevalence of Dentinal Hypersensitivity as per questionnaire and clinical test

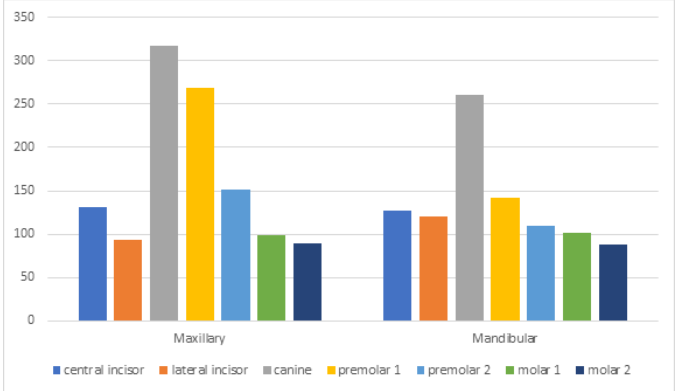

Figure 4: Prevalence of dentinal hypersensitivity according to tooth type

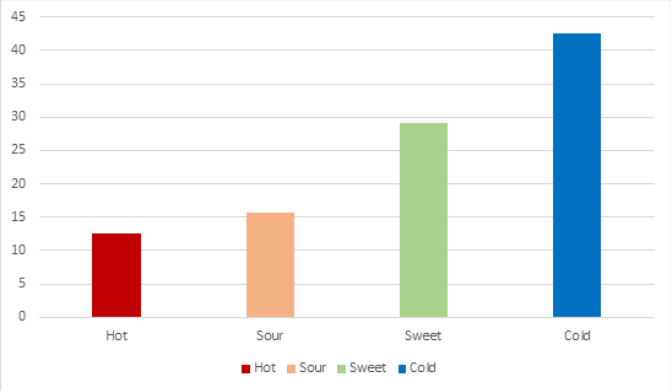

Figure 3: Prevalence of dentinal hypersensitivity in relation various stimuli

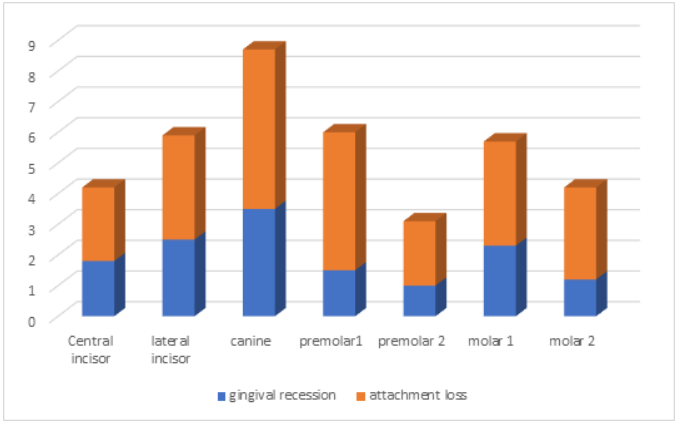

Figure 5: Prevalence of gingival recession and attachment loss in patients with dentinal sensitivity

Table 1: Prevalence of Dentinal Hypersensitivity in relation to various demographic features

Demographic feature			**DH(Q) present(%)**	**DH(Q) not present(%)**
Education	Female	Postgraduate	22.3	77.7
		Graduate	28.8	71.2
		Undergraduate	64.7	35.3
		Illiterate	23.1	76.9
	Male	Postgraduate	19.8	80.2
		Graduate	23.8	76.2
		Undergraduate	25.7	74.3
		Illiterate	30.7	69.3
Diet	Vegetarian		47.8	52.2
	Non-vegetarian		52.2	47.8
Locality	City		34.6	65.7

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	Suburbs	66.6	33.4
Longevity of hypersensitivity	As long as stimulus	56.7	43.3
	Less than 2 min	33.7	66.3
	More than 2 min	28.5	71.5
Duration of dentinal hypersensitivity	Less than 6 months	67.8	33.2
	6 months to 1 year	32.1	67.9
	1-5 years	24.2	75.8
	More than 5 years	18.6	81.4
Use of desensitizing toothpaste	Yes	76.5	23.5
	No	32.6	67.4

DISCUSSION

The present study was aimed at evaluating the prevalence of perceived as well as actual dentinal hypersensitivity in chronic periodontitis patients visiting Government Dental College and Hospital, Srinagar. Upon enquiring through a questionnaire, the perceived prevalence of hypersensitivity was found to be 34%, which is comparable to similar studies in dental college clinics3. Moreover, this perceived prevalence was found to be lower than the actual prevalence (as evaluated clinically), which may have been because of the non-physiologic nature of the air blast testing stimulus. This is in accordance with previous studies of Orchardson and Collins, Chabanski et al, and Lui et al.[4,5,6]

With regard to the gender differences observed in the present study, females were found to have a significantly higher prevalence of dentinal hypersensitivity, as also reported by Sood et al,[3]Udoye, and Fischer and can be attributed to the hormonal and stress-coping differences between the two genders.[7,8,9]

Our study showed the highest prevalence of hypersensitivity in the 30-39 years age group, and lowest in the 60-69 years age group. These findings may be the result of incipient attachment loss and recession in the age group, exposing pristine and sensitive dentine.[10] Hypersensitivity was found to be least in the 60-69 years age group, which may be due to the development of sclerotic and secondary dentine in this age group.[11]

With regard to prevalence in the context of demographic characters, hypersensitivity was reported most often in the undergraduate females, which may be due to more self awareness as compared to their illiterate counterparts, albeit a lack of proper health education and oral hygiene.[12]

In this study, no significant difference was observed in the prevalence of hypersensitivity among vegetarian and nonvegetarian individuals. This is in contrast to that observed by Sood et al.[3] wherein vegetarians were found to have greater prevalence. These results may be due to the distinct dietary patterns of the study population, which differ markedly from the rest of the Indian subcontinent.[13]

With regard to the higher occurrence of hypersensitivity in the rural population, it could

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be due to the poor oral hygiene practices of the rural population.[14] Moreover, the most common stimulus for eliciting hypersensitivity was found to be cold, in accordance to the findings of Orchardson et al.[4] and Chabanski et al.[5] which hold especially true for the cold climate of the site of the present study.

Most of the patients (67.8 %) who self reported dentinal hypersensitivity had endured the condition for less than 6 months, whereas only 24% had been bearing with the condition for more than 1 year. Dentinal hypersensitivity is an obnoxious sensation, and hence patients intuitively seek remediation as earliest as possible. Therefore, 76.5% of the patients also reported the previous use of desensitizing paste, in an attempt to alleviate their symptoms [Table 1].

In the present study, affected teeth were found to be more often associated with attachment loss rather than clinical recession. This suggests that periodontal attachment loss could be an earlier risk indicator for DH than gingival recession.[3] As root surfaces may be exposed after periodontal attachment loss, even in the absence of clinical recession, they can become susceptible to acidic food and drinks, which may soften the dentine.[15] Subsequent tooth brushing with toothpaste may contribute to further loss of tooth structure, thereby aggravating the condition.

CONCLUSIONS

This study demonstrated a 34% prevalence of dentinal hypersensitivity in chronic periodontitis patients visiting Government Dental College and Hospital. To the best of the authors' knowledge, this is the first report of its kind in the mentioned study sample. Hypersensitivity was found to most commonly affect the age group of 50-59 years, undergraduate females, teeth, being precipitated by cold stimuli, and occur in association with clinical attachment loss, even in the absence of apparent gingival recession. These results provide valuable epidemiological knowledge, which can be used to base sound clinical decisions and treatment.

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Source of Support: Nil, Conflict of Interest: None declared