

Retrospective analysis of dentin hypersensitivity among patients at the university of Port Harcourt teaching hospital, Rivers State Nigeria

Abstract: Background: Dentin hypersensitivity impact significantly on individual's quality of life and can cause considerable concern for patients. The aim of the study was retrospectively to determine the prevalence of dentin hypersensitivity among patients attending the dental clinic at the University of Port Harcourt Teaching Hospital. Subjects and methods: This was a retrospective study involving hospital patients. Data of patients diagnosed with dentin hypersensitivity were retrieved from the records of the Oral Diagnosis Unit at the Dental Centre of the University of Port Harcourt Teaching Hospital over a 3.5 years period, between January 1, 2010 and June 30, 2013. Demographic and clinical information were retrieved and analyzed using the SPSS version 17.0 (SPSS Inc., Chicago, IL, USA). Results: A total of 7020 patients attended the Oral Diagnosis Clinic within the period under review. The prevalence of dentin hypersensitivity was 1.37% (96). The age ranged from 12 to 68 years with a mean age of $39.7 \pm \text{SD } 14.3$ years. Most of the patients with dentin hypersensitivity (51%) were within 17-40 year's age bracket. Dentin hypersensitivity was significantly ($p=0.02$) higher in females (58%) than males (42%). The shocking sensation was experienced by the patients on the left side 57 (59.4%), right side 26 (27.1%), and both sides 13 (13.5%). The prevalence of dentinal sensitivity was significantly higher in maxilla than the mandible ($P=0.03$). In this study, gingival recession was seen in all the sensitive teeth. Conclusion: The prevalence of dentin hypersensitivity in this study was low; it was significantly higher in females than in males and showed a decline with age.

Keywords: Dentin Hypersensitivity, Hospital Patients, Oral Diagnosis, Prevalence

1. Introduction

Dentin hypersensitivity (DH) is a typical clinical presentation which can cause considerable concerns for patients [1]. Patients may or may not report this painful and often chronic condition to their dentist or dental hygienist, and when they do, they report experiencing short, sharp pain after a variety of stimuli [2]. Several authors have defined DH [2-5]. However, in an international workshop on DH, was described the situation as a short, sharp pain arising from exposed dentin typically in response to chemical, thermal or osmotic stimuli that cannot be explained as arising from any other forms of

dental defect or disease [6]. Canadian advisory board [6], in 2003 stated, that DH is a disease of exclusion. Therefore, the dental practitioner must rule out other problems, such as caries, fractured or cracked teeth, defective restorations, occlusal trauma, gingival and other dental conditions that could be responsible for dental pain [3,7].

The etiology of DH is multi-factorial; however interactions between several factors including stimuli, as well as predisposing factors, may play an important role in initiating this condition [1,8-10]. Cold and air stimulation are known to be the most common stimuli while dietary acid is also shown to have a significant potential in evoking DH [11]. Among the predisposing factors for DH; gingival recession,

abrasion, erosion and attrition have been considered as the important ones [1,8]. Especially, gingival recession can result in the exposure of the root surfaces and has been considered a common risk factor or contributing feature for subsequent DH [4,12]. DH is also a common finding in patients with chronic periodontal disease since the root surface may be exposed as part of the disease process [4,8,12].

Globally, the reported prevalence of DH varies between 2.8% and 74% [13-16]. The prevalence in patients with gingival recession ranged from 29.7% to 93%^(4,12) and 72.5% to 98% in patients with chronic periodontal disease [4,8,12]. DH occurs more frequently in females than in males [13-14,17-18] and the prevalence varies with age. Previous studies reported peak prevalence at ages 20-59 years old [4,17-19].

The reported prevalence of DH in Nigerian population ranges from 1.34% to 68.4% [11,19-23]. However, there is paucity of data on DH in the South-South region of the country. The aim of the study, therefore, was retrospectively to determine the prevalence of DH among patients attending the dental clinic at the University of Port Harcourt teaching Hospital, Rivers State Nigeria.

2. Subjects and Methods

2.1. Study Setting

The study was conducted at the Dental Center of the University of Port Harcourt Teaching Hospital. The Center became a tertiary dental hospital barely five years ago. It is the only such centre in the Niger-delta region of Nigeria beyond Benin City.

2.2. Methodology

This study involved patients who were seen at the Oral Diagnosis Unit of the University of Port Harcourt teaching hospital, Port Harcourt, between January 1, 2010 and June 30, 2013; a period of 3.5 years. Ethical approval was obtained from the Research and Ethics Committee of the hospital. DH is routinely diagnosed after a thorough history, intra-oral examination and clinical investigation at the Oral Diagnosis Unit of the hospital. Diagnosis of DH was made using air blast from the air-water jet of the dental unit and scratching suspected surfaces with a dental probe. It is accepted that a blast of cold air from a dental air syringe is more likely to record a response from the patient if their problem is one of DHS [10].

Patients who presented with shocking sensation and diagnosed to have DH in the absence of any other dental lesions and those who presented with dental pain, which were diagnosed to have DH in the absence of any detectable dental disease, were selected from the records. Diagnosed cases of DH were treated using acidulated phosphate fluoride gel and patients were discharged home with desensitizing paste containing potassium nitrate. Recall visits, at two weeks interval, were scheduled to reassess improvement in teeth sensitivity. Patients with dental caries, fractured tooth

and restoration, cracked teeth and any other dental pathology were excluded from the study. Demographic information and distribution of hypersensitive teeth among the affected patients was also retrieved from the records. Data was analyzed using the SPSS version 17.0 (SPSS Inc., Chicago, IL, USA), and test of significance was done using Chi-square statistics. $P < 0.05$ was considered as significant.

3. Results

A total of 7020 patients attended the Oral Diagnosis Clinic within the period under review. Few patients 96 (1.37%) had dentin hypersensitivity. The age ranged from 12 to 68 years with a mean age of $39.7 \pm \text{SD } 14.3$ years. Most of the patients with dentin hypersensitivity (51%) were within 17-40 year's age bracket. Dentin hypersensitivity was significantly ($p=0.02$) more in females (58%) than males (42%) with a male to female ratio of 1:1.4 (Table 1).

Table 2 shows the distribution of hypersensitive teeth among the patients. The shocking sensation was experienced by the patients on the left side 57 (59.4%), right side 26 (27.1%), and both sides 13 (13.5%). The prevalence of dentinal sensitivity was significantly ($P=0.03$) higher in maxilla 62 (64.6%) than the mandible 34 (35.4%). In this study, gingival recession was seen in all the patients with sensitivity.

Table 1. Age and sex distribution of patients.

Age(years)	Sex		Total
	Male	Female	
< 17years	1	0	1(1.0%)
17-40 Years	22	27	49 (51.0%)
41-64 Years	20	23	43 (44.8%)
>64 years	2	1	3(3.1%)
	45(42.0%)	51(58.0%)	96(100.0%)

$p = 0.02$

Table 2. Distribution of hypersensitive teeth among the patients.

Variables	Frequency	Percentage (%)
Affected Jaw		
Maxilla	62	64.6
Mandible	34	35.4
Side of the mouth affected		
Right side	26	27.1
Left side	57	59.4
Both sides	13	13.5

4. Discussion

Dentin hypersensitivity can significantly affect an individual's quality of life; it may disturb the patient while eating, drinking thereby limiting dietary choices [24] or impede effective control of dental plaque and compromises oral health. Many people with DH do not specifically seek treatment for this problem but may only mention it at a routine dental visit. For most practitioners, arriving at a definitive diagnosis can be challenging [3].

The prevalence of DH in this study was 1.37%; this was

comparable to 1.34% reported by Bamise *et al.*, [11] in a prospective study done among hospital patients in South Western of Nigeria. The prevalence was different from other reported prevalence values between 16.3% and 74% [20-23]. The wide variation in prevalence has been attributed to a number of factors, including different methods used to diagnose the condition (clinical examination, questionnaire), the type of setting where the study was carried out and variation in the type of the sample population [4,16]. The cultural and ethnic influence on lifestyle, disease perception, view, and reporting are other reasons [19]. The use of questionnaires without concomitant clinical examinations have been found to overestimate the prevalence of DH as the sensitivity recorded could be attributed to other factors such as dental caries [10].

In this study, the prevalence of dentinal sensitivity was significantly higher in females than males. Tan *et al.*, [13] in a study among young people in the Chengdu city, China and Ye *et al.*, [14] among adults in Shanghai municipality reported similar findings. Specialist restorative dental-clinic-based study also reported a higher incidence of dentinal sensitivity in women than in men [19]. However, Bamise *et al.*, [11] reported higher prevalence in males than in females. The reasons for the difference between the two groups regarding the prevalence of DH has been attributed to the fact that DH is more common in individuals who are meticulous and have good oral hygiene. Women irrespective of age are more attentive to basic hygiene than men, reflecting their overall healthcare and better oral hygiene awareness [3,16,19].

Prevalence of DH also varies with age. Previous studies reported peak prevalence at ages 20-29 years old [25], 30-39 years old [18], 31-40 years old [19], 30-39 years old [9,25], 40-45 years old [15], 40-49 years old [26] and 50-59 years old [16,17]. In this study, approximately half (51.0%) of the patients who presented with dentin hypersensitivity were within 17-40 year age bracket. The high prevalence of DH in this group have been found to correspond with the age at which gingival recession is often seen.^[24]

The present study showed a decline in DH with age. Decline in hypersensitivity symptoms after the age of 60 may be due to the development of secondary or sclerotic dentin. Previous studies have not necessarily included large numbers of subjects over 50 years of age due to extensive tooth loss, particularly in the posterior region, or having teeth that were excluded from testing due to heavily restored teeth [5].

In the present study, shocking sensation due to dentine sensitivity was experienced by approximately 60% of the patients on the left-side. It could be explained by the fact that right-handed individuals tend to brush their left-side teeth more zealously which results in hypersensitivity in those teeth. However, the finding of this research contrasted with that of Tan *et al.*, [13] who reported the right maxillary first premolar as most common affected tooth. The present study reported DH to significantly higher on the maxilla than the mandible. This is comparable to the study of Chrysanthakopoulos who reported more hypersensitive teeth

on the maxilla [16]. Furthermore, all the hypersensitive teeth seen in this study showed some level of gingival recession, this is comparable to a study done in Greece [16]. The effect of brushing technique and frequency on DH could be assessed due to incomplete data.

There were a number of limitations to this study. Record analysis showed that in the patients with DH while the quadrant affected was indicated, only few had information on teeth affected. Therefore, the distribution of DH according to the tooth type could not be reported. Furthermore, information on brushing technique and frequency and trigger factors was also incomplete. The results of this study should be interpreted with caution because it is a retrospective analysis of records of hospital patients, and it may not reflect the exact status of the community. In spite of these limitations, it would provide useful baseline data for comparing future community and other hospital-based studies.

5. Conclusion

The prevalence of dentin hypersensitivity in this study was low. The prevalence was significantly higher in females than in males and showed a decline with age. Further study is, therefore, recommended to prospectively determine the prevalence of dentin hypersensitivity in the general population or hospital patient.

References

- [1] Bartold PM. Dentin hypersensitivity: a review. *Aus Dent J* 2006;51:212-8.
- [2] Kim JL, Karastathis D. Dentin hypersensitivity management. In: Darby ML, Walsh MM. *Dental Hygiene Theory and Practice*. 3rd ed. St. Louis, MO: Saunders-Elsevier. 2010:726-35.
- [3] Stojšin I, Petrović L, Stojanac I, Drobac M. Multi-factoriality of dentine hypersensitivity. *Med Pregl* 2008;61:359-63.
- [4] Chu CH. Management of dentine hypersensitivity. *Dent Bull* 2010;15:21-3.
- [5] Que K, Ruan J, Fan X, Liang X, Hu D. A multi-centre and cross sectional study of dentin hypersensitivity in China. *J Clin Periodontol* 2010;37:631-7.
- [6] Chu CH, Lo EC. Dentine hypersensitivity: a review. *Hong Kong Dent J* 2010;7:15-22.
- [7] Pashley DH, Tay FR, Haywood VB, Collins MC, Drisko CL. Dentin hypersensitivity; Consensus-based recommendations for the diagnosis and management of dentin hypersensitivity. *Inside Dentistry* 2008;4:1-35.

- [8] Walters PA. Dentinal hypersensitivity: a review. *J Contemp Dent Pract* 2005;2:107-17.
- [9] Amarasena N, Spencer J, Ou Y, Brennan D. Dentine hypersensitivity-Australian dentists' perspective. *Aust Dent J* 2010;55:181-7.
- [10] Gillam DG. Current diagnosis of dentine hypersensitivity in the dental office: an overview. *Clin Oral Investig* 2013;17 Suppl 1:S21-29.
- [11] Bamise CT, Olusile AO, Oginni AO, Dosumu OO. The prevalence of dentin hypersensitivity among adult patients attending a Nigerian teaching hospital. *Oral Health Prev Dent* 2007;5:49-53.
- [12] Taani SD, Awartani F. Clinical evaluation of cervical dentin sensitivity (CDS) in patients attending general dental clinics (GDC) and periodontal specialty clinics (PSC). *J Clin Periodontol* 2002;29:118-22.
- [13] Tan CS, Hu DY, Fan X, Li X, Que KH. Epidemiological survey of dentin hypersensitivity of young people in Chengdu City. *Hua Xi Kou Qiang Yi Xue Za Zhi* 2009;27:394-6.
- [14] Ye W, Wang GY, Lv J, Feng XP. The epidemiology of dentin hypersensitivity among adults in Shanghai municipality. *Shanghai Kou Qiang Yi Xue* 2009;18:247-50.
- [15] Rees JS, Jin LJ, Lam S, Kudanowska I, Vowles R. The prevalence of dentin hypersensitivity in a hospital clinic population in Hong Kong. *J Dent* 2003;31:453-61.
- [16] Chrysanthakopoulos NA. Prevalence of Dentin Hypersensitivity in a General Dental Practice in Greece. *J Clin Exp Dent* 2011;3:e445-51.
- [17] Kehua Q, Yingying F, Hong S, Menghong W, Deyu H, Xu F. A cross-sectional study of dentine hypersensitivity in China. *Int Dent J* 2009;59:376-80.
- [18] Amarasena N, Spencer J, Ou Y, Brennan D. Dentine hypersensitivity in a private practice population in Australia. *J Oral Rehabil* 2011;38:52-60.
- [19] Udoeye CI. Pattern and distribution of cervical dentin hypersensitivity in a Nigerian tertiary hospital. *Odontostomatol Trop* 2006;29:19-22.
- [20] Azodo CC, Amayo AC. Dentin sensitivity among a selected group of young adults in Nigeria. *Niger Med J* 2011;52:189-92.
- [21] Afolabi AO, Olojede AC, Aregbesola BS, Ogundipe KO. Prevalence and perception of self reported dentin hypersensitivity among dentate population in South-western Nigeria. *Tanz Dent J* 2010;16:29-34.
- [22] Ojehanon PI, Akhionbare O. Prevalence of Dentin Hypersensitivity and its response to non-surgical treatment in Benin City, Nigeria. *Ebonyi Med J* 2011;10:70-4.
- [23] Bamise CT, Kolawole KA, Oloyede EO, Esan TA. Tooth sensitivity experience among residential university students. *Int J Dent Hyg* 2010; 8:95-100.
- [24] Que K, Ruan J, Fan X, Liang X, Hu D. A multi-centre and cross-sectional study of dentine hypersensitivity in China. *J Clin Periodontol.* 2010;37:631-7.
- [25] Gillam DG, Aris A, Bulman JS, Newman HN, Ley F. Dentine hypersensitivity in subjects recruited for clinical trials: clinical evaluation, prevalence and intra-oral distribution. *J Oral Rehabil* 2002;29:226-31.
- [26] Rees JS, Addy M. A cross-sectional study of buccal cervical sensitivity in UK general dental practice and a summary review of prevalence studies. *Int J Dent Hyg* 2004;2:64-9.