Prevalence and perception of self reported dentine hypersensivity among dentate populations in South-western Nigeria

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Abstract
Aim: To determine by questionnaire the prevalence and perception of DH in general dentate populations in south western Nigeria. **Study Design:** A descriptive study of self reported dentine hypersensitivity among dentate populations selected by multistage sampling technique in south western Nigeria. **Subjects and methods:** A structured questionnaire was administered to 373 subjects [170males, 203females, mean age 37.1 (standard deviation +/- 15.8years)] selected by multistage sampling technique in 4 dental clinics in Nigeria. Analysis was done using the Statistical Package for the Social Sciences (SPSS) version 12. **Results:** About 61% of the subjects (60.9%, n=227) reported to have experienced DH. Most of whom were of fifth decade, and significantly more in females (64.5%) and smokers (72.7%) than males (56.5%)[p<0.03] and non-smokers (59.7%) respectively. Approximately 62% (61.9%, n=231) could identify the nature of the pain experienced. Of these 38.1%, (n=88) perceived the condition as a severe problem, 30.3%, (n=70) perceived DH as a minor problem. Forty five percent of those who reported DH had sought professional treatment. Cold was the major stimulus (42.1%) for pain. Fifteen subjects (6%) used desensitising toothpaste (Sensodyne) during periods of discomfort. Of those who sought periodontal treatment (33.8%, n=126), only 23 (6.7%) reported discomfort after treatment. **Conclusion:** Self reporting of DH was similar to previous studies. However, a thorough clinical examination could determine a more accurate prevalence data.

Key Words: prevalence, dentin hypersensitivity, dentate populations, South-western Nigeria

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Introduction
Dentine hypersensitivity (DH) is a relatively common problem encountered in clinical dental practice. It is a condition of transient, sharp tooth pain caused by a variety of exogenous stimuli (thermal, evaporative, tactile, osmotic, chemical), and such pain cannot be ascribed to any other of dental defect or disease (1). It is a common finding in adult dentate population with available prevalence data ranging from 8-57% (2-4), and if it follows periodontal surgical procedures, it may rise to an estimated range of 60-98% (5). In the latter case, it is known as root sensitivity (RS), a term adopted at a workshop of the European Federation of Periodontology in 2002 (5). It has been shown to peak in 20-30year olds and then rise again when in their 50s (6,7).

The primary underlying clinical cause for dentin hypersensitivity is exposed dentinal tubules. This clinical condition allows for fluid flow within the tubules (hydrodynamic theory), such that when the dentinal fluid are subjected to temperature changes or osmotic changes, the movement stimulate a nerve receptor sensitive to pressure, which leads to transmission of the stimuli creating pain. In general, conventional therapy for dentine hypersensitivity is based on non-invasive technique of using desensitising agents which can be applied either professionally or be prescribed to the patient for home use[2]. When this fails, invasive/irreversible options of treatment (permanent restoration, occlusal adjustment, periodontal flap surgery) can be used.

Since the available data on dentine hypersensitivity were derived from two tertiary hospitals in Nigeria which showed a clinically diagnosed prevalence of 16.3% (8) and 1.34% (9) respectively, while reports from other countries reported even higher prevalence, it was felt useful to ascertain the prevalence and perception of dentine hypersensitivity using samples from more locations in Nigeria. This will enable us to know the magnitude of the problem and plan appropriate preventive strategies. This study was carried out to determine by questionnaire, the prevalence and perception of self reported DH in general adult dentate populations in South-western Nigeria and examine some associated aetiological factors.

Methodology

The study population consisted of 373 adult dentate populations selected by multistage sampling technique, who presented at the outpatient dental clinics of Federal Medical Center Owo, Federal Medical Centre Ido-Ekiti, State Specialist Hospital Akure and Lagos University Teaching Hospital between November 2007 and February 2008. Provision of public dental care in South-western Nigeria is mainly through the secondary (General Hospitals) and tertiary (Teaching Hospitals and Federal Medical Centers) health services which constituted the first sampling frame. Established dental hospitals selected for the study included the following:

General Hospitals – State Hospital Akure, Ondo State, General Hospital Lagos, State Hospital Ado-Ekiti, Ekiti State and State Hospital Abeokuta, Ogun State

Federal Medical Centers (FMC) – FMC Abeokuta, FMC EbuteMetta, FMC Ido-Ekiti

Teaching Hospitals – Obafemi Awolowo University, Ile-Ife, University College Hospital Ibadan, Lagos University Teaching Hospital, Lagos State University Teaching Hospital Ikeja.

Table 1: Distribution of respondents by demographic characteristics

	No of Subjects(n=373)	Percentage %
Age Range(years)		
≤20	34	9.4
21-30	135	37.4
31-40	69	19.1
41-50	50	13.9
51-60	41	11.4
61-70	16	4.4
>70	16	4.4
Total	361	100.0
Non response	12	
Gender		
Male	170	45.6
Female	203	54.4
Education		
None	17	4.6
Primary	45	12.1
Secondary	76	20.4
Post-secondary	235	63.0
Occupation		
Schooling	106	28.4
Civil Servant	68	18.2
Trading	45	12.1
Artisan	34	9.1
Professional	33	8.8
Teaching	31	8.3
Pensioner	19	5.1
Unemployed	18	4.8
Farming	15	4.0
Clergy	4	1.1

Each of the hospitals in each sampling frame was given a number and one was randomly picked (State Hospital Akure, FMC IdoEkiti and Lagos University Teaching Hospital). For convenient sampling, FMC Owo was included in the study.

Based on a wide prevalence of 5-57% for DH and 60-98% for RS, a prevalence of 65% was chosen as the average prevalence since the respondents may not be able to differentiate by questionnaire sensitivity due to true DH and RS. This prevalence was used to determine the minimum sample size for this study using the formula for determination of sample size for prevalence studies ($n=z^2pq/d^2$) (10) where n = minimum sample size; z = 1.96 at 95% confidence interval; p = estimated prevalence of DH (65%); q = 1 – p; and d = margin of error (0.05)..This gave a minimum sample size of 350 which was distributed into 4 main hospital based on the mean number of patients attended in one month as a sampling fraction. This gave 175 respondents from Lagos University Teaching Hospital, 70 from State specialist hospital; 70 from Federal Medical centre Owo; and 35 from Federal Medical centre Ido-Ekiti.

Adult patients were picked from the clinic register until the minimum sample size for each selected out-patient dental hospital was obtained.

Study Instruments was a structured questionnaire with open and close ended questions highlighting the socio-demographic variables, smoking habits, past history of DH, aggravating and relieving factors and if a dentist was consulted. Initial pilot study was carried out at dental clinic, State Hospital Ikare, Nigeria. Ethical clearance was obtained from the ethical committee of the institutions where the study population would be obtained. Verbal informed consent was obtained from each respondent prior to administering the questionnaires on them.

Data obtained were analysed using SPSS version 12. Frequency tables were generated and chi-square test was used to check for the possible relationships between variables, with significant relationship set at p-value < 0.05.

Results

A total of 373 respondents were surveyed from the four public government dental outpatient clinics with age range from 17-92years. The mean age was 37.1 years, modal age was 25years, and median age was 33years (standard deviation 15.8years). Twelve (3.2%) respondents did not volunteer their age. Majority respondents (54.4%) were females. Occupationally, scholars constituted of 28.4%, (n=106), civil servants (18.2%, n=68), traders (12.1%, n=45), artisans (9.1%, n=34) or professionals (8.8%, n=33). A sizable majority (83.4%, n=311) had completed secondary school education. [Table 1]

Table 2: Distribution of respondents by age and dentin hypersensitivity

	Hypersensitivity			
Age groups (years)	Yes n (%)	No n (%)	Don't Know n (%)	Total n
≤20	19 (55.9)	12 (35.3)	3 (8.8)	34
21-30	80 (59.3)	47 (34.8)	8 (5.9)	135
31-40	41 (59.4)	26 (37.7)	2 (2.9)	69
41-50	35 (70.0)	13 (26.0)	2 (4.0)	50
51-60	26 (63.4)	15 (36.6)	0	41
61-70	11 (68.8)	5 (31.3)	0	16
>70	11 (68.8)	4 (25.0)	1 (6.3)	16
Total	223 (61.8)	122 (33.8)	16 (4.4)	361

Non response = 12; Freq= frequency

The prevalence of DH was 60.9%, most frequently occurring in the fifth decade (70.0%) [Table 2], with more of the females (64.5%, n=131) affected than the males (56.5%, n=96) [p<0.03], [Table 3] and commoner in smokers (72.7%) compared to non-smokers (59.7%) [Table 4].

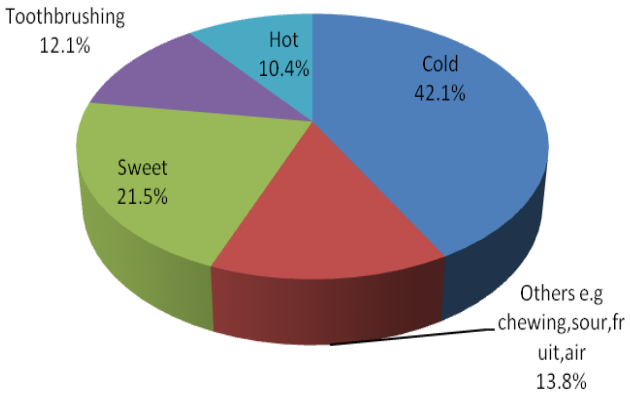

Figure 1: Proportion of respondents by provoking stimulus for dentine hypersensitivity n=297* (*multiple responses)

The provoking stimulus for DH accounted for 297 multiple responses. The commonest aggravating stimulus was cold (42.1%, n=125) followed by sweet (21.5%, n=64), tooth brushing (12.1%, n=36) and hot stimuli (10.4%, n=31). Other stimuli (mastication, sour fruit, air or speech) accounted for 13.8%. [Figure 1]

Two hundred and forty-nine multiple responses were volunteered on the action taken whenever DH was

experienced by the respondents. Forty-four point six percent (44.6%) claimed to visit a dentist (n=111), 27.7% (n=69) and 6% (n=15) used warm saline mouth rinse and desensitising pastes (especially Sensodyne) respectively. Other forms (n=54) of self-treatment accounted for 21.7% [Figure2].

Table 3: Distribution of respondents by gender and Dentine Hypersensitivity

	Dentine Hypersensitivity			
Gender	Yes n (%)	No n (%)	Don't know n (%)	Total
Male	96(56.5)	69(40.6)	5(2.9)	170
Female	131(64.5)	59(29.1)	13(6.4)	203
Total	227(60.9)	128(34.3)	18(4.8)	373

P<0.03 statistically significant

Two hundred and twenty-two multiple responses were obtained in response to sources of information on what was done whenever the respondents experienced DH. Thirty-five point one percent respectively depended on previous experience (n=78) and friend's advice (n=78), while dentist's advice (11.3%, n=25) and other sources e.g. family members, advertisement in the electronic media (18.5%, n=41) were the other sources of information [Figure 3].

Discussion

The result obtained can be said to fairly represent the prevalence of DH in the dentate populations in rural, semi-urban and urban areas in the South-western part of Nigeria, considering the locations of where the study was carried out. The overall average self-reported prevalence of 60.9% for DH was in agreement with Quteish et al (11), and slightly higher than those reported by Irwin, Gilman and Clayton and their colleagues (12-14). Other studies, especially clinical based, yielded a much lower prevalence (11,15). The extreme variation in figures depended on the composition of the sample population, survey location and methods (5). It could also be attributed to a major shortcoming of questionnaire-based study: subjectivity, under or over reporting. In this study, asking respondents to subjectively assess past history/recent history of DH might result in under or over-reporting of the prevalence. Overestimation might result from failure of the respondents to differentiate responses which followed true DH following erosive diet (either intrinsic or extrinsic) (16,17), with a much lower prevalence, from root sensitivity (RS), where it might be almost 100% (5,18). It could also be due to other underlying conditions for which sensitivity is a symptom such as cracked tooth syndrome, fractured restoration, marginal leakage and chipped teeth (16,19). Hence, the prevalence obtained might actually be overstating the prevalence of true DH.

Table 4: Distribution of respondents by Smoking Habit of Respondents and Dentine hypersensitivity

Smoking Habit	Dentin Hypersensitivity			
	Yes n (%)	No n (%)	Don't Know n (%)	Total n
Yes	24 (72.7)	8 (24.2)	1 (3.0)	33
No	203 (59.7)	120 (35.3)	17 (5.0)	340
Total	227 (60.9)	128 (34.3)	18 (4.8)	373

Prevalence by gender showed that DH is higher in females than males (p<0.03). This agrees with previous studies (2,5,8,20). This may reflect their overall healthcare awareness and better oral health awareness compared to the male gender (2,5). However, a recent clinical based study revealed a male preponderance (16). It had long been known that smoking is a predisposing factor in the aetiology DH (13,21,22). This might probably be the reason for the self-reported prevalence of DH to be higher among smokers than non-smokers in this study (72.7% vs 59.7%). This high prevalence might also be due to attempt by smokers to get rid of the teeth stains associated with their habit, with excessive force while brushing their teeth, use of toothbrush with hard bristles and toothpaste with high abrasive particles. This could result in gingival recession, a predisposing factor for both dental erosion and DH that is difficult to correct (17).

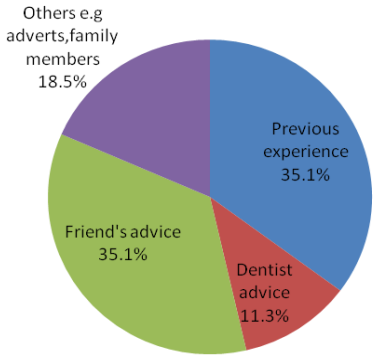

Figure 2: Proportion of respondents by source of information provoking stimulus for dentine hypersensitivity n=222* (*multiple responses)

The commonest initiating stimulus - cold, agrees with previous studies (9,15). It tended to cause fluid flow away from the pulp to produce more rapid and

greater pulp nerve response than other stimuli, such as heat, which can cause an inward flow (2). This explained the rapid and severe response to cold stimulus compared to the slow dull response to heat. The majority of those surveyed perceived their condition as severe and sought treatment in about 45% of cases. Other studies (12,14,20) showed that perceived pain level with DH were relatively low, slight or occasional, and most people do not seek treatment in the majority of cases. The lack of dental awareness of respondents compared to those of other reported studies might have accounted for the late presentation of DH and subsequent severe presentation. It is noteworthy that among the responses for managing DH was the use of warm saline mouth rinse and antibiotics, which apart from having little or no therapeutic value, might actually worsen the pain perceived. This underscores the importance of oral health education aimed at discouraging patients from self treatment and encouraging professional care. Such instruction should also include the role of desensitizing dentifrices in the prevention and treatment of DH. This echoed the conclusion of Dababneh and others (2) that "improvement for a majority of cases will be attained by the recommendation of a desensitizing agent". The percentage of Sensodyne desensitising paste use (6%) is almost similar to a previous study (14), while another study (13) reported a much higher percentage of use. This emphasises the importance of making this over-the counter product certified by relevant regulatory agencies and readily available in pharmacy shops and public hospitals within the country for those affected by this condition. It is also recommended that desensitizing paste should be available in a range of flavours so as to encourage better patient compliance for everyday use (22). The limitations of the study are as follows:

- Failure of the subjects to differentiate between sensitivity which followed true DH following erosive diet, with a much lower prevalence, from RS, where it might be almost 100%, or from other underlying conditions for which sensitivity is a symptom may actually overstate the true prevalence of true DH.
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- Subjectively asking subjects to assess past history/recent history of DH might result in under or over-reporting.
- Evaluation of the subjects' dietary history to rule out the effect of intrinsic and extrinsic erosive factors on true DH might have assisted us in differentiating sensitivity due to true DH and RS following periodontal therapy.

Conclusion

Dentin hypersensitivity, whether true DH or RS, is a common complaint encountered in clinical dental practice, which, if not properly managed, could result in the alteration in the lifestyle of those affected, especially if severe. Proper education of the patient and dental professionals on its prevention is important so that the prevalence in the general population can be reduced. Finally, a thorough clinical examination of patients presenting to the dentists will go a long way in determining a more reliable prevalence data for DH.

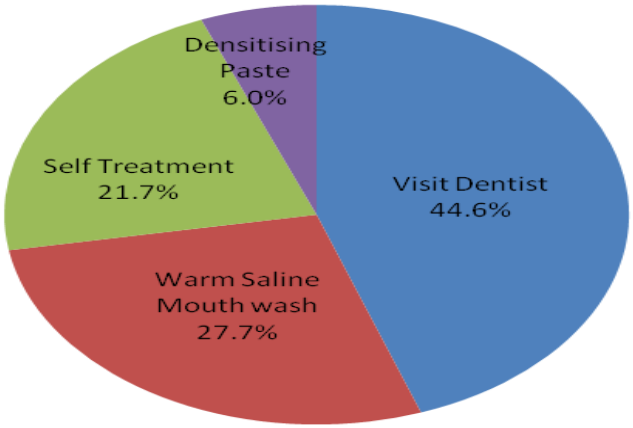

Figure 3: Proportion of respondents by action taken when experienced dentine hypersensitivity n=249* (*multiple responses)

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