

To Assess the Knowledge of Dentists Regarding Dentinal Hypersensitivity in a Tertiary Dental Care Hospital in Bangalore City - A Cross Sectional Survey

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ABSTRACT

BACKGROUND

Dental pain is most commonly associated with the carious destruction leading to inflammation of the pulp or can also be pain present post operatively; however, much of the dental pain can be attributed to dentinal hypersensitivity (DH). The prevalence of DH is high enough (72.5 % to 98 %) to warrant the development of effective treatment. Surveys among dental professionals worldwide suggest that many lack adequate knowledge about this condition and its management. This study aims to assess the knowledge and awareness of postgraduates and faculty regarding dentinal hypersensitivity in a tertiary dental care hospital in Bangalore.

METHODS

A descriptive cross-sectional survey was carried out among the staff and post graduate students at Rajarajeswari Dental College & Hospital, Bangalore during October 2019. Ethical clearance was obtained from the Institutional Ethical committee. All the staff and post graduate students who were present on the day of study were included in the study. Informed consent was obtained from all the study participants before the study and participation was entirely voluntary.

RESULTS

Majority of the participants routinely checked for the signs of DH (F - 77.2 % PG - 77 %) and considered DH as a serious problem (F - 87.5 % PG - 87 %). Participants also thought that DH has to be treated with an interdisciplinary approach (F - 75 % PG - 67.7 %).

CONCLUSIONS

The study concludes that even though the knowledge and awareness of Dentinal Hypersensitivity was good, there existed uncertainty concerning diagnosis and management of the same.

KEY WORDS

Knowledge, DH (Dentinal Hypersensitivity), Diagnosis, Aetiology, Management

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BACKGROUND

The International Association of Study of Pain defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”. Pain in the dental region is most commonly associated with the extermination of the teeth due to caries. In critical situations this can lead to inflammation of the pulp. Occasionally pain can also present post operatively, however much of the dental pain can be traced to dentinal hypersensitivity. A short, sharp pain originating from exposed dentin in response to stimuli, typically thermal, evaporative, tactile, osmotic or chemical, and which cannot be ascribed to any other form of dental defect or pathology is how the condition has been defined as.¹ Its been understood that prevalence of DH (72.5 % to 98 %) is high. This justifies the need for the development of effective treatment.² Although transient it elicits recurrent pain during drinking, eating, brushing of teeth and even during breathing showing its dominance in the subject’s daily activities. Thorough literature review shows that DH can affect the quality of life (QoL) of those who suffer discomfort from this condition.³

When evaluating the management of DH, the condition might be under or overestimated by dentists, hence if not adequately diagnosed and successfully managed by dentists in daily practice, DH can affect the sufferers QoL.³ Prudence for considering a differential diagnosis becomes mandatory when analysing dentinal hypersensitivity as other problems such as caries, fractured or cracked teeth, defective restorations, occlusal trauma, or gingival conditions that could give rise to similar signs and symptoms⁴. DH is therefore a serious condition that needs to be well understood by dentists to ensure that it is diagnosed and managed appropriately.^{4,5} ‘Hydrodynamic theory’ best explains the mechanism of the condition. This theory states that a hydrodynamic stimuli causes shift of fluid across the open dentinal tubules which leads to mechanical activation of nerves in the inner ends of dentinal tubules or in the outer layers of pulp causing the severe sensation of DH.

Currently extensive non-invasive treatment is available. Lack of diagnosis along with under-reporting of the condition presents a major obstacle for the success of any sound treatment plan.⁴ The Canadian Advisory Board on Dentin Hypersensitivity suggested that providers initiate management of this condition by applying desensitizing treatment that is non-invasive; i.e., desensitizing toothpaste and / or topical agents. Some dental providers use a stepped approach wherein treatment is done with multiple visits; others apply and prescribe multiple treatments at one time. Invasive treatments of DH include placing a restoration on an otherwise healthy tooth.^{5,6} Surveys among dental professionals worldwide suggest that many lack adequate knowledge about this condition and its management.^{5,6} The Oxford dictionary defines knowledge as the information, understanding and skills that you gain through education or experience and awareness as knowing that something exists and is important

Therefore this study aims to assess the knowledge and awareness of post graduates and staff regarding dentinal hypersensitivity in a tertiary dental care hospital in Bangalore.

METHODS

A cross sectional survey was carried out among the staff and post graduate students at Rajarajeswari Dental College & Hospital, Bangalore during October 2019. Ethical clearance was obtained from the Institutional Ethical committee. All the staff and post graduate students who were present at the day of study were included in the study. Informed consent was obtained from all the study participants before the study and participation was entirely voluntary.

Questionnaire

A questionnaire containing 17 questions was distributed among the staff and post graduate students of the institution. The questionnaire was outlined based on prevalence, the important predisposing factors, diagnosing methods, management, and continuing education related to DH. Prior to study the questionnaire was distributed among 30 participants who were not part of the study with Cronbach’s alpha coefficient between 0.7 to 0.9 to ensure the validity and reliability The questionnaire was adapted from a study conducted by Exarchou et al in 2017.³ Questions were of multiple choice and the participants were asked to choose the answer best of their knowledge. It was found that participants took 10 to 15 mins for completion of questionnaire. Participants were monitored by the investigator and the questionnaire was collected back after 3 hours.

Inclusion Criteria

Participants who were voluntarily willing to participate and gave informed consent.

Exclusion Criteria

- Participants who were not present at study duration.
- Questionnaires which were incomplete.

Statistical Analysis

Statistical Package for Social Sciences [SPSS] for Windows, version 22.0, released in 2013, Armonk, NY: IBM Corp., was used to perform statistical analyses. Descriptive statistical measures were used. Chi- Square goodness of fit test was used to compare the distribution of participants responses to study questionnaire. Comparison between faculty and postgraduate’s responses to the study questionnaire was done using Chi- Square test. The level of significance [p-value] was set at $p < 0.05$.

RESULTS

Variable	Category	Faculty		PG		Total	
		n	%	n	%	n	%
Age	21 - 30 yrs.	1	1.3 %	95	95.0 %	96	53.3 %
	31 - 40 yrs.	39	48.8 %	4	4.0 %	43	23.9 %
	> 40 yrs.	40	50.0 %	1	1.0 %	41	22.8 %
Gender	Males	42	52.5 %	25	25.0 %	67	37.2 %
	Females	38	47.5 %	75	75.0 %	113	62.8 %

Table 1. Distribution of Age and Gender among Faculty and PG Groups

Out of the total respondents, majority belonged to the age group of 21 – 30 years (n = 96, 53.3 %) and majority were females (n = 113, 62.8 %).

Distribution of Study Samples Based on Their Designation			
Variables	Category	n	%
Designation	Faculty	80	44.4 %
	PG	100	55.6 %

Table 2. Designation Wise Distribution of the Study Sample

Majority of the respondents were post graduate students (n = 100, 55.6 %)

Comparison of Responses towards Study Questionnaire b / w Faculty and PGs Using Chi Square Goodness of Fit Test						
Questions	Responses	Faculty n %	PG n %	χ ² value	P-Value	
Routinely check for signs of dentinal hypersensitivity	Yes	61 77.2 %	77 77.0 %	0.001	0.97	
	No	18 22.8 %	23 23.0 %			
Evaluation dentinal hypersensitivity [DH]	Air Blast	10 16.1 %	28 36.4 %	12.668	0.01*	
	Water Spray	2 3.2 %	6 7.8 %			
	Dental Probe	11 17.7 %	4 5.2 %			
	Pulp Tester	1 1.6 %	2 2.6 %			
	Dental Scaler	0 0.0 %	0 0.0 %			
Gender with Greater Predilection	Combination	38 61.3 %	37 48.1 %	3.390	0.34	
	Males	23 28.7 %	41 41.0 %			
	Females	34 42.5 %	36 36.0 %			
Age group that are mostly affected	Equal in Both	18 22.5 %	16 16.0 %	0.196	0.98	
	Don't know	5 6.3 %	7 7.0 %			
	35 - 45 yrs.	36 45.0 %	44 44.0 %			
	20 - 30 yrs.	9 11.3 %	13 13.0 %			
Frequency of encountering patient with DH in a week?	> 50 yrs.	32 40.0 %	40 40.0 %	6.459	0.04*	
	Don't know	3 3.8 %	3 3.0 %			
	2 - 4 / week	26 32.5 %	51 51.0 %			
Patient ask questions regarding DH	5 - 8 / week	19 23.8 %	15 15.0 %	2.878	0.24	
	Don't Know	35 43.8 %	34 34.0 %			
	Often	30 37.5 %	33 33.0 %			
Duration of Pain lasted due to DH	Sometimes	45 56.3 %	65 65.0 %	1.879	0.39	
	Never	5 6.3 %	2 2.0 %			
	3 weeks	42 52.5 %	49 49.0 %			
Patient initiated conversation on his discomfort from DH	4 - 8 weeks	26 32.5 %	41 41.0 %	6.382	0.04*	
	> 12 weeks	12 15.0 %	10 10.0 %			
	Yes	61 76.3 %	88 88.0 %			
	No	6 7.5 %	7 7.0 %			
	Don't Know	13 16.3 %	5 5.0 %			

Table 3. Comparison of Responses towards Study Questionnaires (Q1 - Q7)

Table 3. Shows that majority of respondents in both the groups (faculty - n = 66, 77.2 %, PGs - n = 77, 77 %) routinely checked for signs of DH. There were almost equal number of respondents in both faculty (n = 38, 61.3 %) and post graduates (n = 37, 48.1 %) used a combination of methods (air blast, water spray, dental probe, pulp tester, dental scaler) for evaluation of dentinal hypersensitivity. This result was found to be statistically significant with a value of 0.01. Majority of respondents in the faculty group (n = 34, 42.5 %) found a greater predilection of dentinal hypersensitivity in females compared to the post graduate group where males were found to have greater predilection (n = 41, 41 %). The age group most commonly affected according to the response of faculty was 35 - 45 years in both the groups (faculty - n = 36, 45 %, PGs - n = 44, 44 %). The majority of respondents in faculty group did not know how frequently they encountered DH patients in a week (n = 35, 43.8 %) while the majority respondents in the PG group encountered 2 - 4 patients per week. (n = 51, 51 %). This resultant value was found to be 0.04 which was statistically significant. Next, both the group were asked if their patients asked questions regarding DH. Majority respondents in both faculty (n = 45, 56.3 %) and PG group (n = 65, 65 %) responded that sometimes their patients did ask questions regarding DH. To the question, on how long the pain

lasted for the patients due to DH, majority respondents in both faculty (n = 42, 52.5 %) and post graduate group (n = 49, 49 %) responded as 3 weeks. Majority of respondents in both faculty (n = 61, 76.3 %) and post graduate group (n = 88, 88 %) responded that their patients initiated conversation on their discomfort on DH. The p value obtained was 0.04 which was statistically significant.

Comparison of Responses towards Study Questionnaire b / w Faculty and PGs Using Chi Square Goodness of Fit Test						
Questions	Responses	Faculty n %	PG n %	χ ² value	p-value	
Perceive Patients' DH as a serious problem	Yes	70 87.50 %	87 87.00 %	0.01	0.92	
	No	10 12.50 %	13 13.00 %			
DH has impact on Patient's QoL	Yes	64 80.00 %	84 84.80 %	2.33	0.31	
	No	12 15.00 %	8 8.10 %			
Severity of DH on QoL	Don't Know	4 5.00 %	7 7.10 %	0.573	0.75	
	Severe	16 20.00 %	19 19.00 %			
	Moderate	57 71.30 %	75 75.00 %			
	Not Much	7 8.80 %	6 6.00 %			
Activities that affect Patient's QoL with DH	Hot Food	0 0.00 %	5 5.00 %	8.57	0.2	
	Tooth Brushing	5 6.30 %	9 9.00 %			
	Soft Drink	3 3.80 %	3 3.00 %			
	Breathe Cold Air	6 7.50 %	4 4.00 %			
	Bleaching / Whitening	0 0.00 %	0 0.00 %			
	Cold foods	11 13.80 %	16 16.00 %			
	Aerated drinks	0 0.00 %	3 3.00 %			
Confidence in diagnosing DH	All of the Above	55 68.80 %	60 60.00 %	9.772	0.04*	
	Very confident	10 12.50 %	11 11.00 %			
	Confident	61 76.30 %	60 60.00 %			
	Somewhat Confident	9 11.30 %	24 24.00 %			
	Not Every Confident	0 0.00 %	2 2.00 %			
	Not at all Confident	0 0.00 %	3 3.00 %			
Advise to DH Patient	Brushing Techniques	7 8.80 %	18 18.00 %	8.455	0.08	
	De-sensitizing Tooth Paste	28 35.00 %	41 41.00 %			
	Professionally applied products	2 2.50 %	6 6.00 %			
	Restorations	3 3.80 %	4 4.00 %			
	All of the Above	40 50.00 %	31 31.00 %			
	Yes	55 68.80 %	71 71.00 %			
Non-dental problems causes DH?	No	8 10.00 %	9 9.00 %	0.113	0.95	
	Don't Know	17 21.30 %	20 20.00 %			
Patient complies with Prof. advise to manage DH	Yes	54 67.50 %	77 77.00 %	2.133	0.34	
	No	9 11.30 %	9 9.00 %			
	Don't Know	17 21.30 %	14 14.00 %			
Need for leaflets / folders to patients with info on DH	Yes	54 67.50 %	54 54.00 %	5.051	0.08	
	No	25 31.30 %	46 46.00 %			
	Don't Know	1 1.30 %	0 0.00 %			
DH should be treated with Interdisciplinary approach	Yes	60 75.00 %	67 67.70 %	5.817	0.04*	
	No	5 6.30 %	18 18.20 %			
	Not Sure	15 18.80 %	14 14.10 %			

Table 4. Responses towards Questionnaire (Q8 - Q17)

* - Statistically Significant

Table 4 shows responses to questions 9 to 17. Majority of respondents in both the groups perceived DH as a serious problem. (Faculty - n = 70, 87.5 %, PG - n = 87, 87 %). DH was considered to have an impact on the patient's quality of life by majority in both faculty (n = 64, 80 %) and PG group (n = 84, 84.8 %). Majority respondents in both faculty (n = 57, 71.3 %) and PG group (n = 75, 75 %) considered DH as moderately severe on patient's QoL (Quality of Life). All the activities like hot / cold foods, tooth brushing, soft drinks / aerated drinks, cold air, bleaching / whitening affected the patient's QoL by majority respondents in both faculty (n = 55, 65.8 %) and PG group (n = 60, 60 %). Majority respondents in both groups were confident in diagnosing DH. (faculty - n = 61, 76.3 %, PG - n = 60, 60 %). The resultant value was 0.04 which was statistically significant. The faculty group had majority

respondents (n = 40, 50 %) advising brushing techniques, de-sensitizing toothpastes, professionally applied products and restorations to their patients whereas majority of PGs advised de-sensitizing toothpastes (n = 41, 41 %). Majority in faculty (n = 55, 68.8 %) and PG (n = 71, 71 %) believed that non-dental problems like GERD, psychological stress, irritable bowel syndrome etc caused DH. Both the groups had majority respondents believing that their patients complied with the professional advises. (faculty - n = 54, 67.5 % PG - n = 77, 77 %). The need for leaflets or folders with information on DH was felt by majority respondents in both groups. (faculty n = 54, 67.5 PG - n = 54, 54 %). Finally, both were asked if DH has to be treated as an interdisciplinary approach to which both groups had majority responding as yes. (faculty n = 60, 75 % PG - n = 67, 67.7 %). The p value obtained was 0.04 which was statistically significant. The results with respect to Q1 to Q3, Q5 and Q6, Q8 to Q10, Q11 and Q13 to Q16 showed statistically no significant association.

DISCUSSION

This cross sectional survey determined the difference in awareness of knowledge and management of dentinal hypersensitivity among staff and post graduates. Previous studies showed paucity of knowledge in this field among the dentists.^{2,3 and 4,5,6,7} As reported in other studies, 1 adult out of 7 are reported to be suffering from DH.² Considering the high prevalence of DH,² we as dentists must know the various initiating factors, clinical features, diagnosing and management methods. A validated questionnaire by Exarchou et al was used in the present study.³

The response rate of this study was quite satisfactory with 97 %. These results suggest that checking the signs of DH was a routine part of examination which was comparable to studies by Exarchou et al (60.2 %)³ and Periera et al (79.1 %).⁴ Majority dentists claimed that they used a combination of methods to diagnose DH. Exarchou et al,³ Fatou Leye Benoist et al⁷ Oderinu et al⁵, Kopycka-Kedzierawski et al⁶ found that majority dentists in their studies preferred air blast, dental scaler and patient report respectively as diagnosing aids. A cross sectional study on prevalence of DH by Haneet and Vandana¹ found 36 - 45 years as the most prevalent age group of DH. The present study also had similar result. However in contrast almost three-quarters (74 %) of participants in a study by Oderinu et al⁵ reported that the average age range of patients with DH encompassed the third to sixth decades of life. This may be due to changes that occur to the dentinal tubules and pulp leading to sclerosed dentin that causes secondary and tertiary dentin formation as age advances. About 38.9 % of affected patients were found to be females. The possible reasons for the generally higher prevalence of DH in female subjects are intensified oral hygiene awareness and the difference in diet.¹ As in previous studies,^{3,4} the participants of this study also perceived patient's DH as a serious problem. Almost 51 % of participants encountered 2 - 4 patients a week with DH.

Dentinal Hypersensitivity gives such sharp pain, that though short, it affects the patient's Quality of Life, giving transient difficulties to otherwise normal daily activities. The result of this study is in accordance with previous studies,^{3,4}

which showed that majority thought DH affected the QoL. As per the participants, an exaggerated number of daily activities of the patients lead to DH. Hot food, brushing techniques, soft drinks, breathe, cold air, bleaching / whitening, cold foods, and aerated drinks were all considered potential factors. Other surveys showed results, wherein a single factor was considered sole reason for DH like dental caries,⁴ tooth brushing habits^{3,5}, loss of enamel², gingival recession.⁶

Considering the management of DH, our study results suggest that majority participants whether staff or post graduates advised de-sensitizing toothpastes to their patients. This was also comparable to previous studies.^{3,4, and 5} Non dental problems like psychological stress, irritable bowel syndrome were also thought as etiological factors. The survey by Gupta et al,² showed that the participants were interested in giving instructions and demonstrations in contrast to our study were in leaflets and folders containing information regarding DH were considered as a need. Dentinal Hypersensitivity is normally treated on the basis of providing symptomatic relief using various DH agents. Majority also felt that their patients complied with their professional advises, similar to results by Exarchou et al.³ The major result of our study was that participants wanted DH to be treated in an interdisciplinary approach. Apparently, there was enough confidence for both groups of participants in diagnosing DH, in accordance with other study which was 63.6 %.⁴ The knowledge gap was found in the proper management of the condition.

CONCLUSIONS

Even though the knowledge and awareness of Dentinal Hypersensitivity was good, there existed uncertainty concerning diagnosis and management of the same. The study thus suggests dental education institutions to include in their curricula, information regarding diagnosis and management of DH and also make it a part of continued dental education programmes.

Limitation

Results of this study may not be generalized as this was done only in one tertiary dental care hospital.

Financial or Other Competing Interests: None.

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