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Original Article

Comparison of Dentin hypersensitivity among female and male patients followed by tooth preparation for Fixed Dental Prosthesis

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ABSTRACT

Objective: To determine the frequency of "dentin hypersensitivity" and compare it between men and women that needed a fixed partial prosthesis (FPD) to replace a missing tooth or teeth.

Study Design: Cross sectional study.

Place and Duration of Study: Department of Prosthodontics, 20 Military Dental Center/CIMS dental College, Multan Pakistan, from Apr 2023 to Nov 2024.

Methodology: This study was conducted in the department of Prosthodontics, 20 Military Dental Center/CIMS dental College Multan. A total of 146 patients of either gender having age between >18 years visited the outpatient department for replacement of missing tooth/teeth with a FPD were included. Dentin hypersensitivity was recorded using Visual Analog Scale. VAS was recorded before and immediately after tooth preparation.

Results: Most of the patients were having age between 36-45 years i.e. (29.4%). 57(39%) of the patients were male and 89(61%) were female. Dentine hypersensitivity found in 59(40.4%) among patients underwent for tooth preparation for FDP and frequency was significantly higher in females 40(67.7%) as compared to male 40(67.7%).

Conclusion: The findings showed that following tooth preparation, women reported higher levels of dentin hypersensitivity than men. To investigate this nature on a gender basis, more researches are required.

Keywords: Dentin Hypersensitivity, Gender, Pain, Tooth preparation, Visual Analog Scale.

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INTRODUCTION

One of the most common procedures done in the prosthodontics department is the provision of crown and bridges, and for that purpose the tooth undergoes mechanical reduction. These teeth are either root canal treated or are vital abutments.[1] In Vital Abutments, Dentin hypersensitivity (DH) following tooth preparation is a common oral health issue. DH is characterized by short sharp pain arising from exposed dentin in response to stimuli—typically thermal, evaporative, tactile, osmotic or chemical—that cannot be ascribed to any other dental defect or disease.[2]

Many factors have been reported to be a cause of increasing incidence of DH in patients. DH typically afflicts individuals in the age range of 20-49 years, especially 30-39 years with reported prevalence figures in the range of 15-20%.[2-5] However, there have been reports of greater levels—up to 57% in general dentistry practice settings and up to 98% for patients after periodontal therapy.[1,2,6,7] Further, studies have revealed that women are more likely to be impacted with DH even at their young age.[8] The buccal-cervical areas of canine and premolar teeth, which are also the area's most prone to gingival recession, are where DH is most frequently seen.[1,2]

It is commonly recognized that gender disparities exist in the perception of pain caused by experiments. "In contrast, studies on gender differences in dentin hypersensitivity are sparse in the peer-reviewed literature".[9, 10] The purpose of this study was to use the Visual Analogue Scale (VAS) to determine the frequency of DH and compare it between men and women in a sample of the adult population who needed to have a FPD placed in place of a lost tooth or teeth.

METHODOLOGY

This cross sectional study was conducted in the department of Prosthodontics, 20 Military Dental Center/CIMS dental College Multan Pakistan after the approval of "Ethical Review Committee of Hospital [2133/Trg/20MDC/CDC dt 17 March, 2023]". The sample size was calculated by taking the prevalence of HD in male i.e. 40%,[5] margin of error = 8%, confidence

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interval =95%, then calculated sample was 146, which was calculated using OPENEPI calculator.

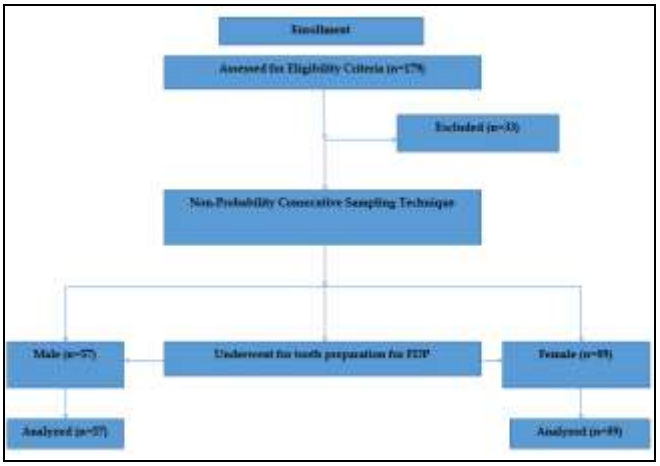
A total of 146 patients meeting the following eligibility criteria were included via non-probability consecutive sampling technique:

Inclusion Criteria: Patients with at least one vital tooth among abutments in need of fixed dental prosthesis, age between 25 to 45 years of either gender, absence of restorations/fracture of the tooth, teeth was free of decay, pulpal and periodontal pathologies (on clinical examination and radiograph) and provided written informed consent.

Exclusion Criteria: Pregnancy, eating disorders, long-term acid reflux, periodontal surgery within the last three months, orthodontic appliance treatment within the last three months, teeth or supporting structures with any other painful pathology or defects, long-term use of anti-inflammatory or analgesic medications, and extensively restored teeth.

After taking written informed consent, an oral examination was performed on each participant to make sure they were healthy overall, with the exception of dentin hypersensitivity symptoms. All individuals underwent thorough clinical and radiographic examinations to rule out dental disorders that could have produced discomfort akin to dentin hypersensitivity. Each FPD contained a minimum of one essential abutment tooth. Only one critical abutment was randomly selected if an FPD has two. A tactile stimulation and a thermal stimulus (a water jet at ambient temperature, 15°C, and 45°C) were applied to each abutment tooth. An explorer was placed cervically over the abutment tooth to identify sensitive teeth. A water jet applied to roughly the same tooth anatomical feature that had received the tactile stimulus was used to induce dentin hypersensitivity ten minutes after the tactile stimulation. A 10 cm visual analog scale (VAS) was used to ask the individuals to rate their overall sensitivity right after stimulation. "No pain" was marked at the 0 cm end of the scale, and "severe pain" was marked at the 10 cm end. A VAS greater than 4 was classified as hyperdentin sensitivity. VAS was used to determine the Dentin hypersensitivity, as this method is widely used for measuring pain and has been used in previous studies, further, as patient's pain can be measured more than once (at least twice) and the findings of each test for that patient compare favorably, the VAS is regarded as reliable.[13] Every step was completed by the lead investigator.

Data was analyzed using Statistical Package for the Social Sciences (SPSS) version-26. Frequency and percentages were computed for age groups, gender, habits and dentine hypersensitivity. "Chi-square test" was used to compare the dentine hypersensitivity with respect to age groups and habits. The "p-value ≤ 0.05 was considered as significant".



Patient Flow Diagram

RESULTS

A total of 146 patients underwent for tooth preparation for Fixed Dental Prosthesis. Most of the patients were having age between 36-45 years i.e. (29.4%) followed by 26-35 years (26.7%), 18-25 years (23.9%) and > 46 years (19.8%). 57(39%) of the patients were male and 89 (61%) were female. Further, 118 (80.8%) of the patients were non-smokers, 9(6.1%) were smokers, 2(1.3%) were ex-smokers and 17(11.6%) had habit of pan, ghutka and chalia, as shown in Table-I.

Table-I: Baseline data of the Patients (n=146)

Characteristics	n(%)
Age	
18-25	35(23.9%)
26-35	39(26.7%)
36-45	43(29.4%)
>46	29(19.8%)
Gender	
Male	57(39.0%)
Female	89(61.0%)
Habits	
Smokers	9(6.1%)
No-smokers	118(80.8%)
Ex-smokers	2(1.3%)
Pan, chalia and ghutka	17(11.6%)

Dentine hypersensitivity found in 59(40.4%) among patients underwent for tooth preparation for

Fixed Dental Prosthesis and frequency was significantly higher in females 40(67.7%) as compared to male 40(67.7%), as shown in Table-II.

Table-II: Frequency of Dentine hypersensitivity among patients underwent for tooth preparation for Fixed Dental Prosthesis (n=146)

Dentine Hypersensitivity	n(%)
Yes (Visual Analog Scale Score >4)	59(40.4%)
No (Visual Analog Scale Score <4)	87(59.5%)
Male	19(32.2%)
Female	40(67.7%)

Further, frequency of dentine hypersensitivity found high in patients underwent for FDP had age group 18-25 years (30.5%) and in non-smokers 47(79.6%), but no statistically significant difference has been found, as p-value > 0.05, shown in Table-III.

Table-III: Dentine hypersensitivity among patients underwent for tooth preparation for Fixed Dental Prosthesis with respect to age groups and habits (n= 146)

Characteristics	Hyper Sensitivity Dentine		*p*-value
	Yes (n=59)	No (n=87)	
Age			
18-25	18(30.5%)	17(19.5%)	0.163
>25-35	17(28.8%)	22(25.2%)	
>35-45	14(23.7%)	35(40.2%)	
>45	10(16.9%)	19(21.8%)	
Habits			
Smokers	3(5.8%)	6(6.8%)	0.898
No-smokers	47(79.6%)	71(81.6%)	
Ex-smokers	1(1.69%)	1(1.1%)	
Pan, Chalia and Ghutka	8(13.5%)	9(10.3%)	

DISCUSSIONS

The current study compares the levels of dentin hypersensitivity in male and female patients following tooth preparation for a fixed dental prosthesis. Dentine hypersensitivity was present in 59(40.4%) of the cases in our investigation; among them, the prevalence was higher in females (67.7%) than in males (32.2%).

According to a study, the prevalence was 21.5% in women and 40% in men. Yadav *et al.*, and Garg *et al.*, in their studies also mentioned same that higher DH was reported by women as compared to men.[13,14] "The higher values of dentin hypersensitivity are may due to the negligence of oral health. Especially in the developing countries, the prevalence of dentin hypersensitivity is high, may due to the lack of awareness and they usually try to avoid the stimulus rather than taking the treatmen".[15]

Research on pain and sensitivity as well as epidemiological studies have demonstrated that men and women experience and manage pain and sensitivity in different ways.[16-18] We are just beginning to look for a mechanical explanation for the reported sex and gender disparities in sensitivity. There are unmistakable signs that several elements, both separately and together, are involved, but we currently know very little about the various factors and their intricate interactions. These elements include, among others, hormones, social roles, exercise, genetics, and the brain's information processing. Therefore, it is imperative that additional research be conducted while considering other issues.

CONCLUSION

It has been concluded from the current study that DH found higher in female as compared to the males in the patients underwent tooth preparation for FDP. Further, it has been found that DH is higher in age group 25-45 years. Therefore, in order to prevent DH , public awareness campaigns about proper brushing technique, good oral hygiene, avoiding abrasive and erosive chemicals and dietary counseling is required.

Conflict of Interest: None.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

BM & MS: Data acquisition, data analysis, critical review, approval of the final version to be published.
ZA & AI: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.
IA & KS: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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