ORIGINAL ARTICLE

EXPERIENCE OF POST CEMENTATION HYPERSENSITIVITY: A KAP STUDY DONE ON DENTISTS & FACULTY IN RAWALPINDI ISLAMABAD

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ABSTRACT

Fixed partial denture is the most commonly used treatment modality for replacing the missing teeth. Fixed partial denture involves vital teeth as abutment for retainers, involving preparation of all tooth surfaces. Post cementation hypersensitivity is a common complaint among patients receiving fixed partial denture on vital teeth. The purpose of the study was to explore the knowledge on Post-cementation hypersensitivity and determining preventive factors among 100 Postgraduate trainee and dental faculty in dental colleges of Rawalpindi and Islamabad, Pakistan. A cross sectional study was done in April 2018. The questions regarding occurrence and various protective measures regarding post cementation hypersensitivity were asked. In this study hypersensitivity occurred in 46% of cases after cementation. The dentists reported that in their experience the amount of tooth reduction (88.0%) was the most important preventive factor followed by occlusion. It was shown that choice of core material (76.1% versus 50.0%) was significantly associated with post cementation hypersensitivity (p-value, 0.01). It was concluded that frequency of hypersensitivity was very high in the study and in dentists opinion amount of tooth reduction is most important preventive factor.

Key Words: *Hypersensitivity; Post cementation; Preventive factors*

INTRODUCTION

Fixed partial denture is used to replace missing teeth and optimize oral function like mastication as well as enhancing esthetics.[1] However, sensitivity to hot and cold are the consequences of newly cemented crown on vital teeth and can become problematic for patient and dentist.[2]

Post cementation sensitivity in various clinical studies have been documented from as low as 3% to as high as 34%.[1] In a study by Rosenstiel and Rashid Post-cementation sensitivity was about 10%.[2] Johnson *et al* estimated the incidence of sensitivity to be 25% whereas Bebermeyer and Berg calculated it to be 10%.[3,4]

Many factors like removal of protective smear layer by acid etching, over tooth preparation, inadequate provisional restoration and micro leakage can be responsible for this post-cementation sensitivity.[5]

This post-cementation sensitivity can be reduced by many means like using water coolant during tooth reduction, using provisional restoration, and occlusal adjustment etc. The most important way is to use desensitizer, bonding system and appropriate choice of luting agent.[1,6]

Bonding agent seals the interface by adhesive bonding and hence reduce micro-leakage. In a study conducted on effect of immediate dentin sealing on prevention of post-cementation sensitivity a statistically significant difference was found ($p < 0.05$) between Group A teeth that were prime and bond and Group B teeth that were left untreated.[7]

Appropriate choice of luting agent can also reduce post-cementation sensitivity. A number of luting agent starting from zinc oxide eugenol to zinc phosphate, zinc carboxylate to glass ionomer cement and recently introduced adhesive resin cements are now available.[8-10]

In a study comparing glass ionomer and adhesive resins as luting agent, no clinically significant difference was found.[11]

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Blocking the tubules and reducing dentin permeability by dentin desensitizer like GC tooth mousse and GLUMA desensitizer can reduce post-cementation sensitivity.[12,13]

The aim of this study was to explore the knowledge on post-cementation hypersensitivity among dental faculty and trainees in Rawalpindi/Islamabad region.

METHODOLOGY

From April 1st, 2018 to April 30th, 2018 a cross-sectional survey using a structured questionnaire was conducted among 100 dental Postgraduate trainees and faculty of dental institutes of Rawalpindi and Islamabad. Inclusion criteria included Postgraduate trainee of Operative and Prosthetic department and their faculty. Undergraduate students and house officers were excluded. In questionnaire, experience of post-operative sensitivity following crown cementation was asked from respondents. If they responded 'yes' then they were asked to mark the preventive factors of sensitivity according to Visual analog scale score system. According to three point response scale the respondents were further asked to mark factors as; i) important, ii) have not tried but important, iii) have not tried as measure in reducing post-operative sensitivity. The study sample was conveniently selected. Ethical committee of institution approved the proposal. Written informed consent was obtained from study participants. The data were entered and analyzed using statistical package for social sciences (SPSS) software version 16.0. Mainly descriptive statistics were computed. Categorical variables such as gender and questions about sensitivity were reported as frequencies and percentages while continuous variables were described as mean and SD.

RESULTS

There were 100 participants (aged 25-40 years) with mean age of 32.53 + 3.65 including 36 males and 64 females. There were 31 (31.0%) respondents with in dental faculty and majority 69 (69.0%) were postgraduate trainees. In this study the respondents mentioned that in their experience overall hypersensitivity was witnessed by 46 (46.0%) respondents after the cementation. (Table 1 and Table 2)

Among five factors for prevention of sensitivity, the amount of tooth reduction was regarded as most important factor by study respondents, as 88 (88.0%) dentists used it for preventing sensitivity. Furthermore, 'careful attention to occlusion' was chosen as better preventive measure by 83 (83.0%) respondents and 'time between preparation and cementation' was highlighted as important by 81 (81.0%) dentists, whereas 'choice of core material' was responded as important by 62 (62.0%) dentists.

Further in the study, the preventive factors were associated with post operative hypersensitivity. The importance of 'not desiccating before cementation' was highlighted equally by the dentists and was found comparable (63.0% vs 59.3%) between the respondents who experienced sensitivity and those who did not, respectively. The importance of choice of core material was found significantly associated with presence of hypersensitivity (76.1% vs 50.0%, p-value, 0.011). The 'amount of tooth reduction' was highlighted as important by majority of dentists (91.3% vs 85.2%), however, it was not found significantly associated with hypersensitivity (p-value, 0.168). Similarly, a large number of respondents thought that 'use of varnish before cementation' is important for prevention and it was also found markedly greater in presence of hypersensitivity category (71.7% vs 59.3%), however, this variation was also statistically not significant (p-value, 0.125). Further details regarding association of preventive measures with hypersensitivity can be found in table 3.

DISCUSSION

The cold and hot sensations during and after a dental problem are routinely seen in the dental OPDs. The hypersensitivity after cementation procedure also happens very commonly and is a huge challenge for dentists.[14,15] This study aimed at exploring the management of post cementation sensitivity done by dentists and their opinion regarding the preventive factors of hypersensitivity. This is one of its types of studies and has not been done before locally or internationally. The current study found almost half (46.0%) of study dentists experienced hypersensitivity after cementation procedure. This figure is quite high as many previous studies have reported post cementation hypersensitivity in the range of 3% to 35%.[1,16] A study by *Rosensteil et al*, noted a very low (2.0%) rate of post cementation sensitivity.[2] Compared to these results, the current study reveals a very high post cementation hypersensitivity which needs to be seen with caution. It could be due to multiple reasons, one could be poor oral health condition and another reason could be unhealthy eating habits of the community such as too much sugary foods and drinks which are hazardous to teeth health.

TABLE 1: DEMOGRAPHIC CHARACTERISTICS

Sex	Number	%age
Male	36	36%
Female	64	64%
Qualification		
Dental faculty	31	31%
Postgraduate trainees	69	69%

TABLE 2: ASSOCIATION OF PREVENTIVE FACTORS WITH POST-CEMENTATION HYPERSENSITIVITY*

	Hypersensitive n=46	Non-Hypersensitive n=54	p-value**
Not desiccating before cementation			
Important	29(63%)	32(59.3%)	0.79
Tried but not important	4(8.7%)	7(13.3%)	
Have not tried	13(28.3%)	15(7.8%)	
Choice of core material			
Important	35(76.1%)	27(50%)	0.011
Tried but not important	7(15.2%)	10(18.5%)	
Have not tried	4(8.7%)	17(31.5%)	
Careful attention to occlusion			
Important	35(76.1%)	48(88.9%)	0.188
Tried but not important	2(4.3%)	2(3.7%)	
Have not tried	9(19.6%)	4(7.4%)	
Time between preparation and cementation			
Important	39(84.8%)	42(77.8%)	0.578
Tried but not important	5(10.9%)	7(13%)	
Have not tried	2(4.3%)	5(9.3%)	
Amount of tooth reduction			
Important	42(91.3%)	46(85.2%)	0.168
Tried but not important	4(8.7%)	4(7.4%)	
Have not tried	0(0%)	4(7.4%)	
Use of varnish before cementation			
Important	33(71.7%)	32(59.3%)	0.125
Tried but not important	4(8.7%)	13(24.1%)	
Have not tried	9(19.6%)	9(16.7%)	

* Chi-square test was applied

** p-value < 0.05 was taken as significant

In the present study as per dentists' opinions and practices the most common preventive measures used for prevention of hypersensitivity were "amount of tooth reduction", followed by "careful attention to occlusion" and "time between preparation and cementation". Many previous investigators have also found a similar trend of preventive factors of post cementation sensitivity. *Rosensteil et al*, noted that significant factors considered "very important" for prevention of hypersensitivity were desiccation, luting agent, occlusion, provisional, and water spray.[2] Another study by Pramod and colleagues reported that selection of the luting agents have a basic role in the prevention of post cementation hypersensitivity.[1] This factor was also highlighted by three-forth of our respondents, however, most of them rated "amount of tooth reduction" as most important preventer of post cementation hypersensitivity. Many other investigators have also found that "selection of core material during cementation" is considered most important in preventing hypersensitivity after the procedure.[17,18]

Many sensitivity preventive interventions are also in place,[19] namely; Glass Ionomer luting cement, Zinc Phosphate cement and Resin-modified Glass Ionomer are used to save patients from post dentistry procedure sensitivity. A study by Chandrasekhar V witnessed that Resin-modified glass ionomer is a better option for preventing post cementation sensitivity.[20] The importance of various preventive factors for post cementation sensitivity cannot be reduced as they have pivotal role in controlling this issue.

The current study has some advantages; firstly, this was one of the very few studies done on post cementation hypersensitivity related factors in the context of understanding and experience of various

cadres of dentists. Secondly, and the most importantly, the experience of dentists regarding post cementation hypersensitivity was also recorded in the study.

There were few limitations as well, as the study focused on the preventive factors only and other details were missed. There was not intervention to prevent sensitivity and only the perception and experiences of the dentists were observed.

CONCLUSION

Post cementation hypersensitivity is very high among patients seen by dental faculty and postgraduate trainees in Rawalpindi/Islamabad. The causes could be multiple and beyond the aim of current study. The study respondents reported that "amount of tooth reduction" was the most significantly important factor which prevents post cementation hypersensitivity. Further large scale studies on this topic are required before generalization of the current study findings.

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