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ORIGINAL ARTICLE

Frequency and severity levels of non-carious cervical lesions in abutments to be used for fixed dental prosthesis.

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ABSTRACT… Objective: To evaluate the frequency and severity of Non-carious cervical lesions (NCCLs) in patients reporting for provision of fixed dental prosthesis to the Department of Prosthodontics at Khyber College of Dentistry. **Study Design:** Descriptive Cross-sectional study. **Setting:** Department of Prosthodontics Khyber College of Dentistry, Peshawar. **Period:** March to September, 2019. **Material & Methods:** Patients of both genders above 18 years of age who reported to prosthetics department for provision of fixed dental prosthesis were included in this study. Frequency of Non-Carious Cervical Lesions was evaluated by visual and clinical examination. The severity levels of NCCLs were classified according to Smith-Knight tooth wear index (TWI) after assessment using William's probe and plain dental mirror. The data was analysed using SPSS version 21. **Results:** Participants ages ranged from 18 to 50 years with a mean age of 46 years ± 2.3 SD. Among the total 149 patients evaluated, 89 (59.7%) had Non-Carious Cervical Lesions. Of these, 52 (58.4%) respondents had level 2 severity. The presence of NCCLs lesion was not associated with the gender and different age groups. **Conclusion:** High frequency of non-carious cervical lesions were found among local population. Thorough investigations of etiological factors is required for the prevention and managements of these lesions.

Key words: Abutments, Cervical, Frequency, Lesions, Non-Carious, Severity.

INTRODUCTION

Non-carious cervical lesions (NCCLs) refer to loss of tooth structure that occurs at cervical third of the tooth crown and the adjacent root surface. They result in loss of tooth structure by a process not connected to caries.[1] NCCLs have a multi-factorial aetiology involving erosion, abfraction and abrasion.[1,2]

Non-Carious Cervical Lesions resulting from abrasion or abfraction take place almost entirely on facial surface with only 2% reported on lingual or palatal surfaces.[3] The facial surfaces of maxillary and mandibular anterior teeth and mandibular posterior teeth are commonly affected sites, possibly due to the fact that these areas are not well protected by serous saliva.[4] The incidence of NCCLs increases with age and is mostly found in middle-aged patients.[5,6,7]

Non-Carious Cervical Lesions might be associated with dentine hypersensitivity and pulp exposure.[8,9] This requires the clinician to be aware of the importance of an intensive medical and dental history and clinical examination along with the causes of NCCLs and factors which modify these causes.[10] Improved understanding of the underlying causes and progression of NCCLs will rely on reliable and practical methods of mapping their topography and monitoring their progress.

Various methods have been used to analyse NCCLs such as simple clinical examinations, optical or scanning electron microscopy (SEM) and micro computed tomography (micro-CT).[11] An index describing the severity levels of NCCLs has been proposed known as the Smith-Knight Tooth Wear Index (TWI).[12] TWI is satisfactory for epidemiological investigations and monitoring of long term lesions.[13]

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Considering the influence of the severity of NCCLs in abutment teeth to be used for Fixed Dental Prosthesis (FDPs), and the absence of local research on the severity of NCCL in local population, a need for research of this kind is highlighted. The purpose of this study is to determine frequency of the severity levels of Non-Carious Cervical Lesions in abutment teeth, in patients reporting to Prosthodontics Department, Khyber College of Dentistry, Peshawar, for provision of Fixed Dental Prosthesis.

MATERIAL & METHODS

This was a descriptive cross-sectional study, carried out at the Department of Prosthodontics of Khyber College of Dentistry over a period of six months from March to September, 2019. Ethical approval was obtained from hospital ethical committee (1359-AD/PG/R/KCD). A total sample size of 149 was calculated using WHO sample size calculator with 13.5% proportion of NCCLs, 95% confidence level and 5% margin of error.

Patients of both gender and above 18 years of age who reported to prosthetics OPD for provision of fixed dental prosthesis on their permanent teeth with bounded edentulous spaces for 3 years or less were included in our study. Whereas patients with abutment teeth having carious cervical lesions and periodontal problems were excluded. After getting informed consent, the purpose, procedures, risks and benefits of the study were explained to the participants and were assured of maintaining confidentiality of their personal and other data collected. Non-probability consecutive sampling technique was used.

After taking detailed history from the participants, facial and lingual surfaces of the abutment teeth were assessed using William's probe and plain dental mirror. The tip of the probe was moved on the tooth surface, going from the bottom of gingival sulcus on the facial and lingual surfaces. If the probe was retained in the cervical region of the teeth because of existing irregularities, such changes were recorded and assessed according to Smith-Knight tooth wear index (TWI). Periapical radiographs were obtained when needed, and sensitivity to cold was also checked by using ethyl chloride spray applied to a cotton pellet and placing it on the tooth surface.

Data was analysed using SPSS version 21. Descriptive statistics such as frequencies, percentages were calculated for categorical variables like gender, severity levels of NCCLs. Mean and standard deviation was calculated for continuous variables like age of a participant.

RESULTS

A total number of 149 patients were examined for Non-Carious Cervical Lesions (NCCLs)using William's probe and plain dental mirror. The participants ages ranged from 18 to 50 years with a mean age of 46 years ± 2.3 SD. Of these, 68% (101) were male and 32% (48) were females. The patients were divided into three age groups. Majority of the patients were in the age group 41-50 years (67%) followed by 31-40 years (25%) while only 8% of the patients were less then 30 years of age. Table-I

	NCCLs n (%)	No Lesions n (%)	Total n (%)	P- Value
Overall	89 (59.7%)	60 (40.3%)	149 (100%)	
Gender				
Male	60 (59.4%)	41 (40.6%)	101 (68%)	> 0.05
Female	29 (60.4%)	19 (39.6%)	48 (32%)	
Age Group				
< 30 years	07 (58.3%)	05 (41.7%)	12 (8%)	> 0.05
31–40 years	23 (62.1%)	14 (37.9%)	37 (25%)	
41–50 years	59 (59%)	41 (41%)	100 (67%)	

Table-I. Socio-demographic Characteristics and NCCLs frequency.

Among the total 149 patients, 89 (59.7%) patients were detected with NCCLs. The frequency of NCCLs was higher in females (60.4%) and age group 31-40 years (62.1%) but there were no

statistically significant difference with Chi-square test. Table-II represents the severity level of NCCLs on the basis of Smith-Knight Tooth Wear Index (TWI).

Severity Level	Frequency (%)
Level 1	12 (13.5%)
Level 2	52 (58.4%)
Level 3	22 (24.7%)
Level 4	3 (3.4%)
Total	89 (100%)

Table-II. NCCLs Severity level using Tooth Wear Index. (TWI).

Majority of the patients with NCCLs were identified with level 2 severity (58.4%) followed by NCCLs severity level 3 (24.7%) and severity level 1 (13.5%) while only 3.4% patients had level 4 severity [Table-II]. Level 2 severity were more common among all age groups [Figure-1].

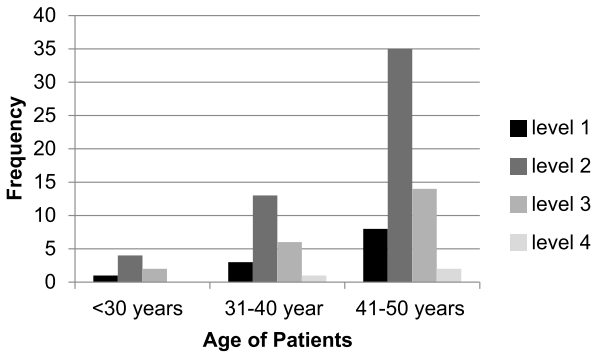

Figure-1. NCCLs severity levels among different age groups.

DISCUSSION

Non-carious cervical lesions (NCCLs) are described as lesions located on the cervical part of the tooth which can cause cosmetic problems, hypersensitivity, pathological changes in the pulp and possibly tooth loss. Results of the present study indicated that in the examined population, 59.7% had NCCLs. The results were consistent with a study conducted by Borčić et al in Croatia where they examined 1002 patients and found that 60 to 70% of patients had one or more cervical lesions[6]. Similarly a review article by Levitch et al who analysed 15 studies published from 1941 to 1991 and concluded that the prevalence of NCCL ranged from 5% to 85%.[14]

With regard to index level, level 2 affected 58.4% of the sample population, followed by level 3 (24.7%). For clinical practice, lesions index levels 2, 3 and 4 have been reported to represent well-formed cervical lesions requiring filling.[6] Therefore, the results of this study should not be overlooked as most of the participants were affected by greater severity lesions. Jakupovic et al studied distribution of different levels of NCCLs in permanent dentition and reported level 1 being the most predominant with a prevalence of 34.4%. Level 2, 3, and 4 were distributed respectively in 13.5%, 3% and 0.5%.[15] The difference in severity levels may be due to wide variation in recording methodologies and different population.[5,6]

Many authors have reported that the number, size, and depth of non-carious cervical lesions increase with the age of the respondents.[6] Borcic et al recorded the prevalence of NCCLs based on tooth wear index observed that the frequency of all index levels increased with the age of the patient.[6] These results may be due to the cumulative effect of etiological factors over time, including a greater degree of gingival recession, fewer existing teeth with higher occlusal load, altered quality and quantity of saliva that are to the aging process.[5,17]

In present study, an increase in the frequency rate and tooth wear severity level was not observed with advancing age and this may be due to no patient from above 50 years of age in the study participants.

Also, despite higher percentage of NCCLs were found in males, no significant difference in the prevalence with gender of patient was found. Very similar results were reported by Kolak et al and Zahra Jafari who found no association of NCCLs with gender of the patient.[5,16]

The limitations of the present study include lack of analysis of the potential etiological factors causing NCCLs. Moreover, data was collected from patients attending prosthodontics department of Khyber Teaching Hospital only and therefore, it cannot be representative of entire population.

CONCLUSION

Results of the present study indicated relatively high frequency of non-carious cervical lesions among local population specially above 30 years of age. High prevalence of NCCLs demands careful monitoring, detailed history and evaluation of etiological factors in order to prevent and manage these lesions successfully. Further research is required to evaluate the stress mechanisms and the dietary factors involved in the etiology of theses lesions.

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2	Asifullah Khan	Introduction, Methods, Discussion.	
3	Asif Rehman	Abstract, Methods, Results, Analysis.	
4	Muhammad Sajid	Discussion, References.	
5	Asfia Saeed	Introduction, References.	
6	Abdul Jalil Khan	Discussion, Proof read.	