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Original Research Article

Prevalence of Non-Carious Cervical Lesions in Patients Reporting to Dental OPD of A Tertiary Care Centre in M.P

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Abstract:

Aim: The aim of the study was to evaluate the prevalence of non-carious cervical lesions (NCCLs) in patients reporting to dental OPD of a tertiary care centre in M.P.

Material and Methods: A descriptive cross-sectional study was conducted on a sample of 775 patients during October 2022 to December 2022. The patients were evaluated for the demographic characteristics, prevalence of NCCLs and oral health practices.

Results: The male to female ratio of the study population was 1.37:1. The maximum number of the participants (25.29%) belonged to 26-35 years age group. The overall prevalence of NCCLs in the study population was 20.51%, while most affected age group was 56-65years (50.57%). Maxillary premolars were the most commonly involved teeth (30.71%) followed by mandibular premolars (22.75%).

Conclusion: NCCLs were more common in male patients and in maxillary teeth. The lesions were more prevalent in patients who reported their tooth brushing intensity to be hard or those who were using hard toothbrush.

Recommendations: NCCLs may pose a major health burden on patient. Focus should be laid on promoting appropriate oral health practices and good dietary habits since the occurrence of NCCLs is largely preventable.

Keywords: Prevalence, Non-Carious Cervical Lesions, Abrasion, Erosion, Abfraction.

Introduction

In the modern era heightened interest without having authentic and reliable information among individuals in maintaining dental health can result in tooth wear over a period of time. The process of "Wear" can occur between occlusal surfaces, proximal surfaces or cervical surfaces and is often triggered by abrasive particles present in food, vigorous tooth brushing, and chemical erosion mechanisms.

Cervical lesions can be defined as lesions that involve the gingival one-third of the facial and lingual surface of the tooth crown. It is found that the cervical lesions can be divided into carious cervical lesions and non-carious cervical lesions [1]. The term non-carious cervical lesions (NCCLs) refer to a group of lesions that includes cervical abrasion, erosion and abfraction [2]. Abrasion, erosion, and abfraction may not be mutually exclusive and may develop in the same individual synchronously. The clinical presentation depends on age, teeth involved and oral health related habits. Apart from loss of tooth structure these lesions result in tooth sensitivity, pulpal disorders, and compromised aesthetics [3]. Risk factors associated with NCCLs include gingival thickness, keratinized tissue width, positional prominence of the tooth, cervical dentine hypersensitivity, Periodontal index, Gingival Index, age, gender, gastric reflux, frequency of consumption of soft drinks, citrus fruits or alcohol [4].

The higher occurrence of NCCLs affects appearance and function, causes distress and lowers the quality of life of the patient. The prevalence of non-carious cervical lesions (NCCLs) ranges from 5% to 85% depending on the various studies that have been carried out around the world [5]. The study was conducted with an aim to assess the prevalence of non carious cervical lesions in patients reporting to a tertiary care centre.

Material and Methods

A descriptive study was conducted in a non-probabilistic, convenient sample of 775 adults aged 18 to 80 years, who attended the Department of Dentistry, SSMC Rewa M.P during October 2022 to December 2022, for routine oral health examination or treatment of dental diseases other than NCCLs. The objective of the study was explained to the patients and the patients who used manual toothbrush with toothpaste for cleaning their teeth and those who consented for participation were included in the study. The exclusion criterion was patients who did not give consent for participation, patients with NCCL diagnosed in retained deciduous tooth/teeth only, those with life threatening diseases or sustaining maxillofacial trauma or patient's in which a tooth group i.e incisive-canine group, premolar group, and molar group was missing. The patients were divided into six age groups; 18 - 25, 26 - 35, 36 - 45, 46 - 55, 56-65 and above 65 years.

For the collection of data, a proforma was used, that consisted of demographic data (name, age, sex, education and address), oral hygiene practices (frequency and intensity of brushing, hardness of toothbrush etc).

Detailed clinical examination for NCCLs was performed if loss of hard tissue was observed near cement- enamel junction under the dental light by using sterile dental mirror, tweezers, cotton swab and a probe. The diagnosis of the lesion was based on the clinical picture of these lesions described in literature [6]. The data was entered into a Microsoft Excel spreadsheet, and statistical analysis was done. Descriptive statistics were calculated for all variables.

Results

A total of 775 patients met the inclusion criterion during the study duration and were surveyed. NCCLs (at least 1 lesion) were found in 159 patients. The overall prevalence of NCCLs was, therefore, 20.51% [Table 1]. Out of 775 patients 448 (57.81%) were males and 327 (42.19%) were females.

The male to female ratio was 1.37: 1. Highest number of participants (25.29%, n=196) belonged to the 26-35 years age group. More than 50.57% patients in the 56-65 years age group presented with NCCLs; hence this age group was the most commonly affected age group. Out of 159 patients who were diagnosed with NCCLs, 89(55.97%) were males and 70 (44.03%) were females. 14.58% study participants were illiterate, 33.93% participants were educated up to middle school and 25.55% were graduates or higher educated [Table 2].

107 patients reported that they practice high intensity tooth brushing and 27.10% participants among this group had one or more NCCLs. Similar results were seen in participants using hard bristled toothbrush (14.45% of the study population) with 37.5% in that group exhibiting NCCLs [Table 3]. Cervical Abrasion, erosion and abfraction were observed in 76.10%, 30.19% and 20.75% patients respectively [Table 4]. In 159 patients a total of 1908 teeth were involved. Maxillary premolars (30.71%) were the most commonly involved teeth in NCCLs followed by mandibular premolars (22.75%) [Table 5].

Table 1: Distribution of patients based on presence or absence of non-carious cervical lesions (NCCLs)

NCCLs Present/Absent	Number of patients(n)	Percentage (%)
NCCLs Present	159	20.51%
NCCLs Absent	616	79.49%

Table 2: Distribution of patients according to demographic characteristics:

Variable	Patients with NCCLs n (%)	Patients without NCCLs n(%)	Total number of patients(n) in the sub group (N=775)
Age			
18-25	06 (4.17%)	138 (95.83%)	**144**
26-35	21 (10.71%)	175 (89.29%)	**196**
36-45	28 (17.72%)	130 (82.28%)	**158**
46-55	37 (28.68%)	92 (71.32%)	**129**
56-65	44 (50.57%)	43 (49.43%)	**87**
>65 years	23 (37.70%)	38 (62.30%)	**61**
Gender			
Male	89 (19.87%)	359 (80.13%)	**448**
Female	70 (20.41%)	257 (78.59%)	**327**
Education			
Illiterate	26 (23.00%)	87 (77%)	**113**
Up to Middle School	34 (12.93%)	229 (87.07%)	**263**
Up to Senior Secondary	45 (22.39%)	156 (77.61%)	**201**

School			
Graduate and above	54 (27.27%)	144 (72.73%)	**198**
Place of living			
Urban	68 (25.56%)	198 (74.44%)	**266**
Rural	91 (17.88%)	418 (82.12%)	**509**

Table 3: Distribution of patients according to oral hygiene practices

Variable	Patients with NCCLs n (%)	Patients without NCCLs n (%)	Total number of patients(n) in the sub group (N=775)
Frequency of brushing			
Once daily	51(15.04%)	288 (84.96%)	**339**
Twice daily	66 (23.32.%)	217 (76.68%)	**283**
More than twice daily	42 (27.45%)	111 (72.55%)	**153**
Intensity of tooth brushing			
Mild	25 (17.73. %)	116 (82.27%)	**141**
Moderate	105 (19.92%)	422 (80.08%)	**527**
Hard	29 (27.10%)	78(72.90%)	**107**
Hardness of toothbrush bristles			
Soft	27 (17.53%)	127 (82.46%)	**154**
Medium	90 (17.68%)	419 (82.32%)	**509**
Hard	42 (37.5%)	70 (62.50%)	**112**
Frequency of changing toothbrush:			
1–3 months	22 (27.16%)	59 (72.84%)	**81**
4–6 months	69 (20.06%)	275 (79.94%)	**344**
6–12 months	35 (16.59%)	176 (83.41%)	**211**
>12 months	33 (23.74%)	106 (76.26%)	**139**

Table 4: Distribution of patients according to type of lesion involved in NCCLs (N=159).

Type of NCCL lesion	Number of Patients (n)	Percentage (%)
Cervical Abrasion	121	76.10 %
Erosion	48	30.19%
Abfraction	33	20.75%

Table 5: Distribution of patients according tooth involved in NCCLs

Tooth Type	Maxillary		Mandibular	
	n	(%)	n	(%)
Incisors	85	4.45%	59	3.09%
Canines	105	5.50%	71	3.72%
Premolars	586	30.71%	431	22.75%
Molars	314	16.46%	257	13.47%

Discussion

Non-carious cervical lesions (NCCLs) are distinct from dental caries and are characterized by the loss of tooth structure (enamel, dentin, and cementum) at the cemento-enamel junction level unrelated to micro-organisms.[7]NCCLs have a multifactorial etiology and the causation has been attributed to hexogen and endogen acids (bio-corrosion) and enzymatic proteases, piezoelectric effects acting on the dentin, mechanical abrasion, functional or para-functional axial and non-axial loads leading to flexion of teeth [8,9]. The prevalence of NCCLs in this study was 20.51%. Kaboré WAD et al reported a lower prevalence rate of 13.8% in their study [6]. Zuza A et al. reported a higher prevalence rate of 52% in their study [10]. The prevalence of NCCLs in literature ranges from 2%-93% [11,12]. The prevalence was higher (50.57%) among older populations (56-65 years age group) in this study which was in accordance with other studies which reported these lesions to be age related [11, 13]. A male predilection was seen with the male to female ratio of 1.37:1. This finding is widely reported in literature and can be attributed to a greater masticatory strength and high bite forces in males [4,14].

In the present study cervical abrasion was seen in 76.10% patients, erosion in 30.19% and abfraction in 20.75% patients. This was in accordance to the study by Kaboré WAD et al where abrasion was seen in 47.4%, erosion in 25.5% abfraction in 27.1% patients [10]. NCCLs were most common (27.45%) in the patients who reported brushing more than twice daily. Many studies have found an

association between good oral hygiene and the occurrence of NCCLs [12, 15]. The use of tooth brushes with hard bristles was reported by 107 (13.81% of the study population) participants, Out of them 27.10% presented with NCCLs. This was in accordance to study by Haralur et al. who reported the use of toothbrushes with hard bristles in 46% of patients with NCCLs [16].

The most commonly involved teeth in the present study were the maxillary premolars (30.71%) followed by mandibular premolars (22.75%). However this finding was in contrast to the study by Zuza A et al who found mandibular first premolars was the most affected teeth followed by the maxillary second premolars (37.3%) [10]. Ali OE et al studied prevalence of NCCLS in Patients with gingival recession and also found that mandibular first premolar (left) was the most affected tooth [4].Preventive strategies are integral in the management of patients with NCCLs [17]. Focus should be laid on promoting the use of tooth brush with soft bristles, use of proper brushing technique, restricting the intake of acidic drinks and food and management of medical conditions like Gastro esophageal reflux disease and bruxism. The restorative treatment may include providing minimally invasive adhesive restorations to the patients along with root coverage surgical procedures if necessary [18]. The limitation of the study was that it was a cross sectional study with a small sample size. Certain factors like composition of saliva, gingival and periodontal status, occlusion and socio-behavioural factors etc were not assessed. Large scale, comprehensive studies taking into account all these factors should be conducted.

Conclusion

The findings from the study shed light on the prevalence and factors associated with NCCLs. Since 20.51% of the surveyed population was diagnosed with NCCLs, the study emphasizes that they are a serious concern. Given the impact of NCCLs on tooth structure and sensitivity, it is crucial for individuals to seek guidance from dental professionals. Proper brushing techniques and selecting the right toothbrush can play a vital role in preventing and managing these lesions.

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