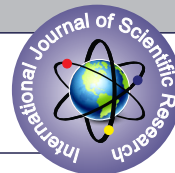


**THE PREVALANCE OF NON-CARIOUS CERVICAL LESIONS IN PATIENTS
REPORTING TO DEPARTMENT OF CONSERVATIVE DENTISTRY OF DENTAL
COLLEGE IN MARATHWADA REGION OF MAHARASHTRA
A CROSS-SECTIONAL STUDY**

**Endodontics**

Dr. Pawan Raktade	Reader & Pg Guide, Department Of Conservative Dentistry And Endodontics, Chhatrapati Shahu Maharaj Shikshan Sanstha's Dental College, Kanchanwadi, Aurangabad.
Dr. Kshama Sarak*	Postgraduate Student, Department Of Conservative Dentistry And Endodontics, Chhatrapati Shahu Maharaj Shikshan Sanstha's Dental College, Kanchanwadi, Aurangabad. *Corresponding Author
Dr. Sadashiv Daokar	Professor & Hod, Department Of Conservative Dentistry And Endodontics, Chhatrapati Shahu Maharaj Shikshan Sanstha's Dental College, Kanchanwadi, Aurangabad.
Dr. Kalpana Pawar	Professor & Pg Guide, Department Of Conservative Dentistry And Endodontics, Chhatrapati Shahu Maharaj Shikshan Sanstha's Dental College, Kanchanwadi, Aurangabad.
Dr. Aishwarya Ranjalkar	Postgraduate Student, Department Of Conservative Dentistry And Endodontics, Chhatrapati Shahu Maharaj Shikshan Sanstha's Dental College, Kanchanwadi, Aurangabad.
Dr. Komal Potfode	Postgraduate Student, Department Of Conservative Dentistry And Endodontics, Chhatrapati Shahu Maharaj Shikshan Sanstha's Dental College, Kanchanwadi, Aurangabad.
Dr. Mohit Thakur	Postgraduate Student, Department Of Conservative Dentistry And Endodontics, Chhatrapati Shahu Maharaj Shikshan Sanstha's Dental College, Kanchanwadi, Aurangabad.

ABSTRACT

Background: The non- carious cervical lesions will cause deterioration of aesthetics, oral function loss, sensitivity and pain. Sensitivity due to these lesions is very painful state which affect directly life quality. Hence, early diagnosis and proper treatment is necessary for such lesions. **AIM:** To evaluate the prevalence of non-carious cervical lesions in patients reporting to department of conservative dentistry of dental college in Marathwada region of Maharashtra. **Materials And Methods:** In this cross-sectional study, Informed consent (Annexure 1) was received from 500 patients participating in the study. A questionnaire was designed in order to collect information on sociodemographic details of patient. (Annexure 2) Clinical examination of the oral cavity was done by a single examiner trained and calibrated at CSMSS Dental College, Aurangabad. The Smith and Knight tooth wear index (Annexure 3) was used to identify Non-Carious Cervical Lesions in the participants. Socioeconomic status was assessed using the modified Kuppuswamy scale Oct 2022 (Annexure 4). All permanent teeth were examined for the presence/absence of noncarious Cervical Lesions. After all teeth were examined, the highest score was recorded, and the participant was classified on the basis of the highest score obtained. Calculation of the mean and standard deviation (SD) of four parameters/levels index was done. **Results:** The data obtained from questionnaire and clinical examinations showed that the prevalence of noncarious cervical lesions was 25% i.e. 125 patients were diagnosed with non-carious cervical lesions out of the total examined 500 patients. In conclusion, the research clearly showed that there is a high prevalence of non-carious cervical lesions, which are associated with various risk factors.

KEYWORDS

Non-carious cervical lesion, prevalence, Smith and Knight tooth wear index.

INTRODUCTION

The term non- carious cervical lesions have been ascribed to the loss of tooth substance at the cements/enamel junction, unrelated to dental caries. [1] It is caused by age, diet, medications, chemical trauma, pathology and wear, erosion, wear and abfraction etc. related to oral habits [2][3]

There are various appearance of NCCLs, from a broad disk-like lesion to a shallow depression or a large wedge-shaped defect. The floor of the lesion may be flat, indented, or sharply angled [4]

The tooth structure loss will cause deterioration of aesthetics, oral function loss, sensitivity and pain. Sensitivity due to these lesions is very painful state which affect directly life quality [5]. Hence, early diagnosis and proper treatment is necessary for such lesions.

These lesions in human teeth are classified into three categories: abrasion (tooth structure loss of mechanical origin), abfraction (tooth structure loss due to flexure of tooth by occlusal forces and consequent fatigue of enamel & dentin) and erosion (loss of tooth structure of chemical or idiopathic origin). The loss of tooth structure in cervical area of non-carious cervical lesion may cause esthetic problems and discomfort because of dentinal hypersensitivity. [6]

The layer of enamel in cervical area is thinner and the direction of

prisms is straight and vertical on the surface of cements/enamel junction. The enamel here is not as hard and bond between enamel and dentin is weaker because the junction is smooth without ridges. [7] The enamel is irregularly structured i.e., it is an area of non-prismatic enamel, resistant to carious because it is less soluble in acid [8]. This explains why the occurrence of non-carious cervical lesions is more frequent than carious in this area.

Clinical studies and observations have shown that cervical lesions are often situated on the vestibular surfaces of teeth, seldom on lingual surfaces and rarely on proximal surfaces. They are also more pronounced on incisors, canines and premolars and more prevalent in maxilla than in mandible with no significant difference between left and right sides of mouth. [9][10] The prevalence and severity of lesions have been found to increase with age. [11]

As life expectancy and public desire for good oral health is increasing, this disease presentation needs effective solutions. It is imperative to develop tactics for raising public awareness and preventing these injuries. For that the local community disease burden has to be assessed. The prevalence and severity of these lesions are unreported so far in a Maharashtrian population of Marathwada region.

Hence, the aim of the study is to determine the prevalence of non-carious cervical lesions and its association with socioeconomic status

in patients attending the Department of conservative dentistry and endodontics in CSMSS dental college, Aurangabad

Clinical Concerns With Necls

- The tooth structure is structurally undermined by these lesions, which can progressively deepen over time. This can result in either the involvement of the dental pulp or the loss of the tooth crown due to severe notching of the tooth necks.
- Unesthetic disfigurement of dentition.
- Predispose to plaque retention, caries incidence and sensitivity.
- Problematic restorations with difficulty in isolation, adhesion, accessing of sub/ equigingival margins and polishing.
- Lower retention rate of restorations at these sites.

MATERIALS AND METHOD

This study included questionnaire and clinical examination on dental patients attending the Department of Conservative Dentistry and Endodontics, CSMSS Dental College and Hospital, Kanchanwadi, Chhatrapati Sambhajnagar (Aurangabad).

All new patients (above 24 yrs), during months August-December 2023, were included. Only those patients were included in the study that fulfil the following criteria and were agreed to participate in the study. The number of males and females in the study were 264 and 236 respectively.

Inclusion Criteria:

1. Non-edentulous
2. Age 24 years old and above patients

Table 1. Age of patients

Range	56.00
Minimum	24.00
Maximum	80.00

A single examiner clinically evaluated patients who exhibited non-carious cervical tooth wear. The distribution and severity of tooth wear were recorded using Modified Tooth Wear Index. Clinical examination was performed in dental chair with a mouth mirror and explorer. The teeth had not been cleaned or dried prior to evaluation. However, food debris obscuring visual inspection was removed. No radiographs were taken. The vestibular surfaces of the teeth were thoroughly dried prior to the examination and the cervical surfaces of each tooth from second molar to second molar were examined in the same sequence for each patient. The data was recorded with the help of an assistant. In addition to the TWI, the frequency of cervical lesions was also recorded for each patient.

The TWI has five scores:

- 0 is no loss of contour
- 1 is minimal loss of contour
- 2 is defect <1 mm deep
- 3 defect 1-2mm deep
- 4 defect that exceeds a depth of 2 mm, or involves pulp exposure, or exposes secondary dentine.

In cases of doubt, a lower score was assigned. Useful modifications have been suggested in the use of this index. They were adopted as follows. The examining probe was passed along the tooth surface from the root onto the crown and if there was no change in contour detected as it crossed the CEJ, or only a smooth disturbance, the surface was scored Code0 - "No change in contour".

A distinct jump or "click" as the probe crossed the CEJ indicating a definite junction, barely visible to the naked eye, was scored Code 1 "Minimal loss of contour". A defect at the CEJ or just below, visible to the naked eye and producing a marked jump, could be scored as Code 2 - "Defect < 1mm deep" or higher, as appropriate. The presence of calculus or restoration at the deepest point of cervical wear would hinder the accurate assessment of the root surface. The surface was then scored Code R. However, if it was clear that the maximum depth of a cervical defect was located away from such obscuring influences, then the appropriate Code 0-4 was applied.

Data from paper questionnaire and clinical examination were entered, analysed and their association with various factors was tabulated.

RESULTS AND TABLES

The data obtained from questionnaire and clinical examinations

showed that the prevalence of non-carious cervical lesions was 25% i.e. 125 patients were diagnosed with non-carious cervical lesions out of the total examined 500 patients and tooth prevalence found to be 2.6% (Table-2). The prevalence of males and females detected with non-carious cervical lesions were 52.8% and 47.2% respectively (Figure-1).

Table 2.

Total no. of patients	500	100%
Patients with NCCL	125	25%
Total no. of teeth examined	16000	100%
No. of teeth with NCCL	420	2.6%

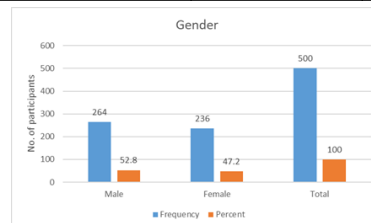


Fig 1. Gender of patients

The relationship among socioeconomic status (SES) and patients having non-carious cervical lesions was also analysed (Figure-2). A positive correlation was observed between upper middle class and patients with non-carious cervical lesion.

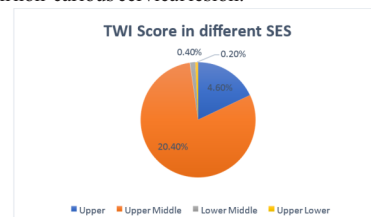


Fig 2. TWI according to SES

Overall percentage of non-carious cervical lesion is also recorded (Table 3). The levels 2-4 represent lesions in dentine.

Table 3. Lesion Severity

TWI	No of teeth	%
0	15580	97.4
1	196	1.2
2	172	1.1
3	32	0.2
4	20	0.1
5	0	0

The TWI distribution of incisors, canines and pre-molars is depicted in Tables 4, 5, 6 respectively. The highest frequency of level 2 was found for mandibular molar followed by maxillary first premolars. Highest frequency for level 3 was found for upper and lower canine. Level 4 was highest for maxillary second premolars. Maxillary premolars exhibited the highest degree of impact, with maxillary molars and mandibular premolars being affected to a slightly lesser extent.

Table 4. TWI values observed in incisors

TWI	11	21	31	41	12	22	32	42
0	98.6	98.6	92.4	91.6	99	99	94.4	94
1	1.2	1.4	6.4	6.6	1	0.4	3.8	4.2
2	0.2	0	0.8	1.2	0	0.6	1.8	1.4
3	0	0	0.4	0.4	0	0	0	0.2
4	0	0	0	0.2	0	0	0	0.2
5	0	0	0	0	0	0	0	0

Table 5: TWI values observed for canines and premolars

TWI	13	23	33	43	14	24	34	44	15	25	35	45
0	98.2	97.4	98.2	97.4	94.8	97.4	97.6	97	97.2	98.2	98.4	99
1	0.4	1.2	0.4	1.2	1.6	0.6	0.6	0.8	0.4	0.6	0.6	0.2
2	1	0.4	1	0.4	2.6	1.4	1.4	1.4	1.2	1	0.8	0.4
3	0.4	0.8	0.4	0.8	1	0.6	0.2	0.4	0.6	0.2	0.2	0.2
4	0	0.2	0	0.2	0	0	0.2	0.4	0.6	0	0	0.2
5	0	0	0	0	0	0	0	0	0	0	0	0

Table 6. TWI values observed in molars

TWI	16	26	36	46	17	27	37	47	18	28	38	48
0	98	97.2	97.6	97	99.6	98.2	97.8	98.8	99.8	99.6	99.6	100
1	0.2	0.8	0.4	0.2	0.2	0.4	0.2	1	0.2	0.2	0.4	0
2	1.6	1.8	1.8	2	0.2	1	1.8	0.2	0	0.2	0	0
3	0.2	0.2	0.2	0.8	0	0.2	0.2	0	0	0	0	0
4	0	0	0	0	0	0.2	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0

DISCUSSION

A noncarious cervical lesion (NCCL) is defined as a defect resulting from the loss of tooth structure at the cementoamel junction (CEJ) that is not related to bacteria^[12]. Noncarious cervical lesions are also commonly referred to as “abfraction lesions”^[13], “cervical wear”^[14], “cervical abrasions” (or “noncarious cervical tooth surface loss”), “abfraction-like cervical lesions”, and “vestibular cervical dental abfractions”^[15]. The multifactorial etiology of NCCLs in combinations with abrasion, attrition, occlusal stress and biocorrosion.^[16] The prevalence and severity of lesions have been found to increase with age.^[12]

This study included questionnaire and clinical examination on dental patients. The distribution and severity of tooth wear were recorded using Modified Tooth Wear Index. The TWI is considered a good index and it has been used in previous epidemiological studies^[17]. In this study, it was depicted that the prevalence of non-carious cervical lesions was 25% i.e. 125 patients were diagnosed with non-carious cervical lesions out of the total examined 500 patients and tooth prevalence found to be 2.6%. When relationship between socioeconomic status and NCCL was analyzed, a positive correlation was observed between upper middle class and patients with non-carious cervical lesion. NCCL development was significantly associated with the material, toothbrush and toothbrushing technique used for oral hygiene maintenance, individuals who used a horizontal scrub technique had a significantly greater tendency to develop NCCLs. The Tooth wear Index distribution of incisors, canines and pre-molars is depicted simultaneously in this study.

Results revealed that the highest frequency of level 2 was found for mandibular molar followed by maxillary first premolars. Highest frequency for level 3 was found for upper and lower canine. Level 4 was highest for maxillary second premolars. Maxillary premolars exhibited the highest degree of impact, with maxillary molars and mandibular premolars being affected to a slightly lesser extent.

The prevalence of NCCLs among adults is above 46 % and is higher in older populations as compared to younger, worldwide^[18]. Exposed cervical dentin, with or without tooth wear, can result in dentin hypersensitivity (DH), defined as a short, sharp pain in response to thermal, evaporative, chemical stimuli, tactile, osmotic, that cannot be attributed to any other flaw or pathology^[19]^[20]. Kitchin noted that vestibular surfaces of teeth were the main locations of cervical wear lesions, very less on lingual and rarely on proximal. The impact of both on physical and psychosocial dimensions of oral health-related quality of life (OHRQoL) indicated by patient-centred results of the effects of dentine hypersensitivity and NCCL. In addition, the analysis of these outcomes contributes to favoring the communication between professionals and patients, clinical decision-making, and the patient's involvement in their own health care^[21]^[22]. Quality of life measures related to general health such as the EuroQol five-dimensional (EQ-5D) and specific OHRQoL measures such as the Oral Health Impact Profile (OHIP), Oral Impacts on Daily Performance (OIDP)^[23]. According to the populations' epidemiological reality and the individual's own perception of health must be the guiding principle of dental practice. To identify factors that indicate the occurrence of common oral conditions, professionals utilize this information to understand the causes and progression of conditions like NCCL and DH. They can then implement suitable interventions to manage the impact of oral diseases.

CONCLUSION

Noncarious cervical lesion and Dentin hypersensitivity are common conditions among adults and both are associated with oral health impact. As life expectancy and public desire for good oral health is increasing, this disease presentation needs effective solutions. It is imperative to develop tactics for raising public awareness and preventing these injuries. For that the local community disease burden has to be assessed.

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