

Evaluation of non-carious cervical lesions in all dental Shahid adoughi faculty (Iran) of clinical courses in 2016¹Dr Hadi Salimi, Assistant professor; Shahid Sadoughi Univ Med Sci, Fac Dent, Dept Prosthodont, Yazd, Iran²Fateme Ahmadi Khoob, Student of Shahid Sadoughi Univ Med Sci, Fac Dent, Yazd, Iran**Corresponding Author:** Fateme Ahmadi Khoob, Student of Shahid Sadoughi Univ Med Sci, Fac Dent, Yazd, Iran**Type of Publication:** Original Research Article**Conflicts of Interest:** Nil**Abstract**

Background: Variations in diagnosis and terminology outlined earlier, along with possible local variables. Such as dietary differences and oral hygiene habits between one population and another, also contribute to the variable picture which emerges from considering pervious studies.

So in any society, finding the prevalence of this lesion may be needed in prevention, treatment and the progress achieved over time. The aim of this study was to investigate the prevalence of non-caries cervical lesions in clinical undergraduate dentistry students of Yazd Shahid Sadooqi dental school

Materials and Methods: In this study 260 dental students of Yazd Shahid Sadooqi dental school in year 1395, after the initial examination and approval of the basic criteria of inclusion, buccal and lingual incisors, canines, premolars and molars in supine position on the dental unit with Meridan explorer were examined and classified according to TWI index.

Also a questionnaire included medical history, dental, oral habits, oral hygiene and dietary habits was completed by the researcher.

Results:All variables mentioned can somehow be involved in the creation NCCLs Anna cannot waste any cited as definitive proof. All the variables mentioned can somehow be involved in the creation of NCCLs, although none of them can be cited as the definitive proof. In this study, a number of health, nutrition and Oral habits were

examined. Using whitening toothpaste abrasives and other materials such as salt and baking soda to clean teeth, number of exposing teeth to acidic substance in days or weeks and Evaluation of patients with canine guidance or group function occlusion type should be considered better in future studies.

Conclusion: Once again and definitely this study emphasizes on NCCLs as multifactorial dental lesions.

Keywords: abrasion, erosion, abfraction, NCCL

Introduction

The cervical region or dental cervical part is prone to the spread of many types of pathologies. Cervical caries is common in this area due to the tendency of plaque to accumulate in this area. The cervical region is also prone to the spread of notch-shape lesions, which are referred to as cervical non-carries lesions (1).

Other diseases have become more prevalent due to the spread of oral hygiene due to the prevalence of caries and periodontal lesions (2).

In older societies that keep their teeth for longer, the issue of dental wear has become increasingly important in the dental profession (3). Today, non-carries lesions such as abrasion, urogenital and aberration have been considered in this regard (2). Loss of tooth structure through a non-carries mechanism may vary between different individuals in terms of cause and clinical manifestation and are associated with physiological or pathological processes

(4). These processes are categorized into Abrigen, Ergen and Abfraction.

Abrasion is the pathological wear of a tooth as a result of abnormal processes, habits, or the use of abrasives (4). According to Pindborg, abrasion is the loss of tooth material through factors other than dental contact (5). Brushing is the main reason for dental abrasion in the cervical region. This may be related to the technique, the frequency of brushing, the design of toothbrush bristles and abrasive toothpaste (4). Experimental studies have shown that brushing horizontally in the form of grooves and brushing vertically creates U-shaped gaps (4). Recent studies by Abrahamsen have shown that toothpaste - not a toothbrush - is abrasive enough to cause these lesions if the person brushes with a sawing and very intense brushing. He suggested that the term toothpaste abrasion replace abrasion toothbrush (6).

Erogenesis is defined as an obvious chemical analysis in enamel and dentin that is unrelated to decay and creates a hole with a smooth, hard floor (2).

Ergen is classified according to the source of the acid, which can be external or internal. Internal sources of acid originate in the stomach and are associated with eating disorders such as anorexia and bulimia or acidic gastric reflux and vomiting. External sources of acid in the diet include carbonated beverages, fruits and juices (7).

Today's diet contains significant amounts of acid. This acid can easily demineralize the serum enamel and dentin, making it more prone to tooth wear caused by toothbrushes (1).

Some believe that the shape of the lesions is related to their cause. A group of authors stated that lesions with sharp, distinct margins may have been caused by abrasive factors, while urogenital lesions would cause wider lesions and platelets with less depth (7).

The term aberration is derived from the studies of Mccoy, Lee, Eakle, and Grippo, and is used as a theoretical process by which occlusal forces cause stress in the enamel and dentin during the cervical region, making it more prone to erosion and abrasion. Has been described as slow (5). Mccoy stated that braxism can be the primary cause of aberration, and dental flexion caused by traction stress can lead to cervical fractures (5).

Lee and Eakle later hypothesized that the primary etiological factor in cervical lesions was the effect of traction stress caused by chewing and malocclusion, which led to displacement of tensile and compressive stresses, resulting in weakened enamel and dentin. If the force reaches the point of fatigue, cracks and fractures will occur. When force is applied to an area, the opposite area is under stress. When the direction of force changes, the tooth bends in the opposite direction and the stress returns to the cervical region. Therefore, bending the tooth in this direction and that side causes fatigue and fracture of the area that has had the most bending (5).

These intercellular forces cause physical microscopic fractures or aberrations in the cervical region (5). Enamel is weak in traction, so tensile forces may cause hydroxyapatite crystals (HA) to break down, allowing water and small molecules to penetrate between enamel prisms and prevent re-formation of interstitial bonds to relieve stress. Be released (5).

Lee and Eakle suggested that the dental cervical support area may be exposed to a single stress or torque force due to occlusal function and parafunctional application, the area where the most stress is applied. The bending forces break the normal crystalline structure. This process makes hydroxyapatite crystals more susceptible to chemical and mechanical degradation, resulting in aberration (5).

Eventually, the enamel in the margin of the cervix ruptures and the dentin is exposed and the process continues (5).

NCCLs lesions in the clinic are described as plate-shaped, concave, wedge-shaped, and irregularly flattened, and can be more fully described according to indicators such as size and depth (4).

NCCLs lesions include loss of hard tissue and in some cases restorative material in one-third of the crown and subcutaneous root surface through processes unrelated to decay (8). Clinical studies and observations have shown that cervical non-carious lesions are usually located on the buccal surface of the teeth and are rarely seen on the lingual and proximal surfaces. These lesions are also more common in incisors, canines, and premolars, and are more common in the maxilla than in the mandible (7). NCCLs have multifactorial etiology, but the share of different processes has not been determined (8).

Many dental professionals felt that excessive eagerness to brush and use abrasive toothpaste was the primary cause of the lesions, but Lee and Eakle suggested that the tensile stress created in the tooth during possible occlusal loads was possible. It has a role in causing serous erosive lesions (3).

They described three types of stress that occur during teething and parafunctional operations:

- Compression - Resistance to condensation
 - Stretching - resistance to stretching
 - Shear - Resistance to twisting, slipping and collapsing
- (3).

In a non-ideal occlusion, many lethal forces may be created, leading to compressive stress on the side of the tooth to which the force is applied and stretching stress on the opposite side (3).

Due to the fact that the enamel is strong against pressure but weak against tension, the areas under tension are prone to failure (3).

It has been hypothesized that when the tooth is hyperchlorinated, the chewing forces are transferred to the tooth, and the tooth in turn transfers this energy to the cervical region (5). In fact, aberration was thought to be the result of forces related to chewing, swallowing, and malocclusion (8). But Gibbs et al. Found that occlusal forces were about 40 percent of the maximum bite force during swallowing and chewing (5).

According to Suit et al., The average tooth contact during chewing is only about 194 milliseconds and 683 milliseconds during swallowing (5). By this comparison, it can be said that parafunctional forces and malocclusion play a more effective role than chewing and swallowing (8).

The forces on one side cause compressive stress on the side where the tooth bends and stress on the other side. These stresses cause microscopic fractures in the enamel and ivory in the cervical region. These fractures extend in a direction perpendicular to the longitudinal axis of the tooth, leading to a localized lesion around the CEJ (5). An important epidemiological finding associated with aberration is the failure to observe NCCLs lesions in pre-contemporary societies. NCCLs were not observed in studies of their prevalence in ancient American skulls or in historical and prehistoric skeletons in southern France (8).

When effervescent lesions have no clinical reason or are shallow (less than one millimeter), they should be monitored at regular intervals (for example, once every six months). Standard intraoral images, model studies, and measurement of lesion dimensions can be performed on these examinations, but these methods are usually only useful for long periods of time (months and years) (1).

The effectiveness of this treatment has not yet been proven and is not currently recommended as a treatment. In fact, improper occlusal adjustment may lead to risks such as caries, occlusal abrasion, and sensory sensitivity (1). Progression of abrasion lesions has been suggested. However, it should be noted that the use of occlusal splints to reduce bruxism is still controversial (1).

The aim of this study was to investigate the prevalence of cervical non-caries lesions in dental students in the clinical course of the School of Dentistry, Shahid Sadoughi University of Medical Sciences, Yazd (Iran) in 2016.

Methods and Materials

The present study is descriptive cross-sectional. To conduct this study, 260 dental students of Shahid Sadoughi University of Medical Sciences (Iran) were examined. The sample size was calculated according to the article of Telles et al. (9), and taking into account the prevalence of 52% and the level of confidence of 95% and the accuracy rate of 7% and the fall rate of 10%. In this study, 260 dental students of the clinical course of the School of Dentistry of Shahid Sadoughi University of Medical Sciences in Yazd were examined. All students were informed of the purpose of the study and were assured that their information would be kept confidential. First, the information form attached at the end was completed by the researcher. The information will be collected through the information form of gender, age, medical history, parafunctional habits, diet and oral hygiene. Information form in the medical history section about the frequency of reflux and heartburn and vomiting; In the section on parafunctional habits about bruxism, clenching, and the history of the use of occlusal splints in the diet section on the consumption of acidic foods such as citrus fruits, juices and carbonated beverages, and in the oral hygiene section on brushing, an area of The mouth, which is first brushed, included the type of toothbrush and

the method of brushing. The students underwent a clinical examination after completing the information form.

The dental unit was examined in supine position and in unit light. To examine each tooth, the tip of the Meridian catheter in the dental cervical region was moved vertically from the gingival margin to the middle of the buccal and lingual surfaces of the tooth toward the incisal. Any superficial violence in this study was considered NCCLs. To increase the accuracy of the examinations, each catheter was used only for the examination of three people and then was decommissioned. These wastes are classified according to the TWI (Tooth Wear Index) provided by Smith and Knight (6, 10, 11):

0 = No change in dental contour

1 = Minimum tooth contour loss

2 = lesion less than one millimeter deep

3 = lesion with a depth between one to two millimeters

4 = lesion with a depth of more than two millimeters or pulp exposure or secondary ivory exposure

According to this classification, a code was considered for each observed lesion.

The depth of the lesions was measured and recorded with the Medis probe. After collecting the information and entering it into the SPSS 16 software, using descriptive statistics (frequency-percentage) and analytical statistics (k test and, if necessary, Fisher's exact test), the results are analyzed at 95% confidence level. This plan was discussed at the meeting of the ethics committee and was approved with the code IR.SSU.REC.1395.149.

Results

The frequency of NCCLs lesions with code 1 of the TWI index at the buccal level in men is slightly higher than in women, and in other cases the frequency of lesions is higher in women. The prevalence of NCCLs lesions on buccal and labial surfaces is much higher than on lingual surfaces of teeth. According to the announced results,

most of the lesions are at the buccal level and code 1 of the TWI index is the lowest lesion. Only two of the people surveyed use a hard toothbrush, which seems to be important for students' awareness of the importance of using soft and medium toothbrushes for periodontal tissue health.

According to Table 1, all people who used rolling and scrub methods for brushing had NCCLs lesions, but this could not indicate a plausible link between the brushing method and the prevalence of brushes.

Table 1: The frequency of lesions according to parafunctional habits in individuals Fisher's exact test.

p-value	Has a lesion Frequency (percentage)	No waste Frequency (percentage)	There lesion	
			Parafunctional habits	
0.349	(91/7) 44	(8/3) 4	Has	Braxism
	(85/4) 181	(14/6) 31	Does not	
0.827	(85/7) 48	(14/3) 8	Has	Klanching
	(86/8) 177	(13/2) 27	Does not	
0.245	(75) 12	(25) 4	Has	Nail biting
	(87/3) 213	(12/7) 31	Does not	
0.294	(75) 6	(25) 2	Has	Chewing ice
	(86/9) 219	(13/1) 33	Does not	

The frequency of NCCLs lesions is not significantly different in people with parafunctional habits and people without these habits, and this may be due to the effect of other factors influencing the occurrence of these lesions. Frequency of NCCLs lesions TMJ joint problems that can be caused by parafunctional habits. There is little difference in people with incorrect digestive habits with Farad without these habits in view of the frequency of lesions, which is not very significant and once again emphasizes the multifactorial nature of the etiology of these lesions.

Discussion

In the present study, the prevalence of suppository, urogenital and aberration lesions in dental students in clinical courses with an age range of 22 to 28 years and an average age of 23.5 years was evaluated in this evaluation. Parafunctional habits, Temporomandibular Joint Problems

(TMJ), Gastrointestinal Problems, and Improper Nutritional Habits were examined. The number of studies conducted to determine the prevalence of NCCLs due to existing limitations is small, and one of these limitations is the lack of proper identification of these lesions. Some studies have examined small populations, and each study classifies waste in a way that makes it more complex when there is a great deal of diversity in society and even in an individual at different times (3). The extent of NCCLs lesions has not yet been determined with conclusive evidence because research and samples are diverse and it is difficult to compare their results (10). In this study, lesions were not categorized in terms of cause, clinical form, and appearance because studies have shown that most NCCLs lesions are multifactorial (12). It does not have a single mechanism; it is difficult and even impossible to clinically differentiate an aberration lesion from a supergene or urogenital lesion (10).

Therefore, it is necessary to accurately assess the patient in order to clarify the possible causes of the presence of lesions, including non-existent forces caused by parafunctional habits, incorrect health habits, as well as incorrect nutritional habits (13). The prevalence of these lesions in the study of Smith, Marchan, and Rafeek has been reported to be 5% to 85% (14). Also, in the study of Brandini et al., The prevalence of these lesions was reported to be 2% to 90% (15). Pikdoken et al. Examined 30 patients with a mean age of 59.5 years, of whom 475 showed NCCLs (74.1%) (16). In a study by Reyes et al., 46 patients were examined and the age range of the samples was 23 to 82 years. This study reported the prevalence of NCCLs lesions in 50% of individuals and 10% of teeth (17).

Takehara et al. Examined 159 men with a mean age of 36.2 years and the prevalence of their study was 49.1% (11). According to the results of the examination of 260

clinical dental students of the Faculty of Dentistry of Shahid Sadoughi University of Medical Sciences in Yazd, 86.5% of the studied samples showed at least one case of NCCLs.

The prevalence of NCCLs lesions in this study is reported separately according to TWI classification. 86.5% of the samples have a lesion with code number 1 of the TWI index, 35% have a lesion with code number 2 and 1.5% have a lesion with code 3.

This wide scope may be related to differences between authors in defining NCCLs and the ability of examiners (14). Different age groups have also been studied in different studies, and this can be a reason for the difference in results. This is because studies have shown that the prevalence of these lesions increases with age (3, 9). NCCLs lesions are commonly seen on the buccal and labial surfaces of teeth, and these lesions are rarely seen on the lingual surface of teeth (1).

Numerous studies have shown that the distribution of stress and strain in the cervical region is similar at the buccal and lingual levels, so it can be concluded that other factors such as urogenital in addition to occlusal loads are effective in causing these lesions. It has already been pointed out that these wastes are multifactorial. According to Erosion factors, saliva flow can be used to explain the difference between the prevalence of lesions at the buccal and lingual level. Clearly, the clearance and leaching of saliva at the lingual level is greater than at the buccal level, which in turn leads to the excretion of erosive factors from the lingual region. The language protection effect must also be considered (1). Improper hygiene habits are one of the causes of NCCLs lesions. According to Piotrowski et al., 75 percent of 32 people with NCCLs had a hard toothbrush and 78 percent had a front and back scrub (13).

The present study shows that all people who choose the scrub method for brushing have NCCLs lesions. The method of rolling brushing was also studied in this study and it was observed that all people who use the rolling method have NCCLs lesions.

In a study by Smith et al., The role of abrasion caused by toothbrushes and hygienic habits such as the use of abrasive toothpaste or materials such as salt that causes abrasion of teeth is mentioned in the development of NCCLs lesions (12). Radentz et al. Reported that the first area to be brushed is more exposed to abrasives than other areas, resulting in more wear and tear (18). According to Brandini et al.'s study, many studies have reported a link between the prevalence of NCCLs and oral hygiene, and the main reason for this association is health habits such as brushing, brushing and the force that a person uses when brushing (15). A study by Takehara et al. Shows that brushing with high force can be associated with NCCLs, but the stiffness of toothbrush bristles is not a significant factor in participating in the formation of NCCLs lesions. However, a previous study found that there was a link between the difficulty of brushing and the formation of NCCLs. This discrepancy between previous studies and the Takrhara study could be due to differences in the percentage of people who use a hard toothbrush. In previous studies, about 75 percent of the samples used hard toothbrushes, while only 20 percent of new studies used hard toothbrushes (11).

Wiegand showed in 2009 that supergene in ivory increases with decreasing filament diameter, which makes the toothbrush softer and more flexible, and this could indicate that more flexibility of soft toothbrush bristles leads to more contact and Longer bristles on the toothbrush and tooth surface increase the amount of abrasive movements on the surface (15).

161 of the 260 samples examined in this study used medium toothbrushes, 97 soft toothbrushes and only 2 hard toothbrushes. It seems that the small number of users of hard toothbrushes is due to the awareness of the advantages of soft and medium toothbrushes for gingival structure. The frequency of NCCLs lesions in both soft and medium groups was approximately the same (86.5%) and this indicates that the present study did not find a relationship between tooth hardness and the frequency of NCCLs lesions.

Piotrowski et al. Reported that people with gastrointestinal problems showed a high percentage of NCCLs lesions (84%). Gastrointestinal problems and eating habits that cause the accumulation of acids of internal and external origin in the oral environment are effective in the occurrence and prevalence of these lesions.(13)

Takehara et al. Considered urogenital a risk factor for NCCLs lesions.(11)

According to a study by Smith et al., A significant association was found between the presence of NCCLs lesions and patients with a history of gastric irritation and gastric reflux(14). There is also a significant association between patients with NCCLs and vegetarians or those who include citrus fruits, juices, soft drinks, alcohol, yogurt, chewing gum, and carbonated vitamin C in their diet.(14)

Groups of patients who consume citrus fruits and acidic beverages more than once a day show a significant association with NCCLs lesions compared to patients who use them once or less.(14)

This study shows that the higher the frequency of consumption of these foods, the more effective is the frequency of NCCLs lesions(14). According to the present study, 77.8% of people with gastroesophageal reflux disease also have at least one NCCLs lesion. However, 87.9% of people without gastroesophageal reflux disease

have shown these lesions. 5 // 81% of people who have heartburn have shown lesions, but in 1/87% of people without heartburn, lesions have also been seen. In all cases of recurrent vomiting, NCCLs were observed, while 86.1% of those without these symptoms also showed lesions.

The results of the present study on malnutrition habits and problems are not much different from people without these habits and it is not possible to deduce a general rule from it because these lesions are multifactorial and each person may have several factors. Also, the present study did not pay attention to the frequency of these habits and only considered the existence of these nutritional habits.

Brandini et al. Reported that the prevalence of NCCLs was 80% in men and 44% in women (18). Numerous examples of Piotrowski's study and his colleagues have shown a link between a history of bruxism, precursor contacts in central occlusion, and interference with lateral movements with NCCLs lesions (13). The J S Rees study provides evidence that occlusal forces may be involved in the loss of tooth structure in the cervical region. The study found that stress caused by these forces in the cervic area of the tooth could break the bands between the enamel crystals. Severe non-exaggerated forces produce severe tensile and shear stresses in the cervic area of the tooth, and these forces disrupt the integrated structure of the enamel. This finding is entirely consistent with the findings of studies showing that NCCLs lesions are more common in people with bruxism (1). Some clinicians and authors believe that stretching and compression stresses play a primary role in the formation of NCCLs (19). Wood et al. Concluded that in vitro, the combination of occlusal forces and acidic environment could create cervical grooves (3). In the present study, 48 out of 260 people had bruxism, 44 of which showed NCCLs lesions (91.7%), while 85.4% of those without bruxism also

showed NCCLs lesions. Also, 56 people had clenching and 48 of them showed lesions (85.7%) and in 86.8% of the lesions were observed without these habits. This result also confirms that NCCLs lesions are multifactorial and that bruxism or clenching cannot independently be the cause of this lesion. As can be seen from these results, people may not have a problem with bruxism or clenching, while they have poor eating habits or digestive problems.

Conclusion

According to the results of the studies, the prevalence of serious non-carious lesions in dental students is 86.5%. This study once again confirms the multifactorial nature of NCCLs lesions. According to the results of this study, one or more of the factors considered can be the cause of NCCLs lesions, but in the case of each lesion, the cause of the lesion cannot be determined precisely because each person may be in the same unit at the same time. Exposure to more than one of these etiological factors or exposure to different etiological factors over time.

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