

ORIGINAL RESEARCH ARTICLE

PREVALENCE OF CERVICAL ABRASION IN TERTIARY CARE CENTER OF CHITWAN

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Received: 13 Sep, 2020

Accepted: 9 Nov, 2020

Published: 16 Dec, 2020

Key words: Cervical abrasion; Frequency of tooth-brushing; Toothbrushing method; Type of tooth-brush.

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Citation

Shrestha L, Kayastha PK, Singh AK, Dhungel S. Prevalence of cervical abrasion in tertiary care center of Chitwan. Journal of Chitwan Medical College. 2020;10(34):57-60.



Peer Reviewed

ABSTRACT

Background: Cervical abrasion is defined as the loss of tooth substance that occurs in the absence of carious mechanism at cemento-enamel junction of a tooth. This type of lesion can cause discommodating effects in dental health. The aim of the study was to assess the prevalence of cervical abrasion among general population in Chitwan and to relate the finding to probable etiology, thereby developing an etiological hypothesis that can be beneficial during treatment.

Methods: The study was carried out between August 2019 and October 2019 in 500 adults who attended the department of Conservative Dentistry and Endodontics, COMS-TH. A proforma consisting of demographic data, type of diet and oral hygiene practices was used for the data collection and each patient went through a clinical examination as well. The statistical analysis was performed using SPSS. Descriptive analysis was performed and Chi-square test of association was done.

Results: Total prevalence of cervical abrasion in the study population was 10.4%. A statistically significant relationship was observed between cervical abrasion, gender, age, toothbrush frequency, method of tooth brushing and type of toothbrush employed. The study affirmed that population with cervical abrasion had hypersensitivity.

Conclusions: The prevalence of cervical abrasions was seen to increase with age, frequency of toothbrushing, faulty method of toothbrushing and use of inappropriate type of toothbrush. Hence, it is advocated that dental professionals guide people on correct brushing technique and use of appropriate type of toothbrush to avoid and prevent this problem from worsening.

INTRODUCTION

In the modern era because of people's increased interest in keeping their dentition healthy for a longer period of time can lead to tooth wear.¹ Patients may present various types of tooth wear, one of them can be presented as cervical abrasion, particularly the lesions on the cervical third regions with non-microbial or non-carious origin.

Cervical abrasion is defined as the loss of tooth substance that occurs in the absence of carious mechanisms at the cemento-enamel junction of a tooth.² This type of lesion is often considered to have an abrasive brushing etiology, though this assumption has recently created controversy. Nevertheless, increased frequency of brushing has been connected to the prevalence of cervical lesions.^{3,4} In vivo study, it had been observed that rapid loss of hard tissue as a result of increased frequency of tooth brushing created negative effect for remineralization in dental hard tissue.^{5,6}

These lesions are observed to be free of plaque and not discolored.^{5,7,8} They appear to be seen in different shapes. Frequently observed types may comprise of simple flat floored

grooves, defects that are seen as C-shaped in cross-section with rounded floors, undercut defects with a flat cervical wall and a semicircular occlusal wall, as well as typical V-shaped grooves with oblique walls that intersect axially.⁹⁻¹¹

Cervical abrasion, a routine problem in the modern world, is noticed to cause discommodating effect in the dental health of people. This study intended to assess the prevalence of cervical abrasion among general population in Chitwan and to relate the finding to probable etiology, thereby developing an etiological hypothesis that can be beneficial during its treatment.

METHODS

After receiving clearance from the institutional ethical committee, a cross-sectional study was conducted among 500 adults aged 15 to 80 years, who attended the Department of Conservative Dentistry and Endodontics, COMS-TH. A convenient sampling technique was used. The required sample size was calculated from a previous study with similar population and outcome.¹² Sample size was calculated using formula:

$$n = z^2(pq)/e^2$$

e=+5%, Z=1.96(at95%confidence)p=58.7%, q=100-p=47.82%
n= 431.15

The study was conducted for 3 months from August 2019 to October 2019. Only those patients using manual toothbrush for cleaning their teeth and who agreed to participate were included in this study. The patients were divided into five age groups; 15 - 25, 26 - 35, 36 - 45, 46 - 55, and above 55 years.

For the collection of data, a proforma was used, that consisted of demographic data (name, age, sex, occupation and address), oral hygiene practices (frequency and method of cleaning teeth) and type of diet. Clinical examination of the teeth for each patient was carefully performed under the dental light by using a dental mirror and a probe. The examination was done by a single examiner using under good illumination using sterile dental diagnostic instruments (dental mirror, probe, tweezers) and the data was collected with by the assistant. Clinical examination for cervical abrasion was performed.² The data was entered into a Microsoft Excel spreadsheet, and statistical analysis was done using the statistical package SPSS version 25.

Descriptive statistics were calculated for all variables and analytical statistics was also done with a Chi-squared test to determine the association between demographic variables, dietary habit and pattern of brushing, with the presence of cervical abrasion. A p-value < 0.05 was considered as significant. Contingency table analysis was performed to analyze and present if any statistically significant association was found.

RESULTS

Five hundred patients were examined with ages ranging from 15 to 77 years, with a mean age of 29.4 years. Of the total

subjects, males formed 36% of the study population whereas females were 64%. Similarly, the prevalence of cervical abrasion was found in 52 patients, that is 10.4% of the total 500 patients examined. The prevalence of cervical abrasion was significant in patients between ages 46 to 55 years. This age group represented 40.4% of the patients with cervical abrasion, and the difference between the groups was statistically significant (p<0.05) as shown in the Table 1.

Table 1: Distribution of study population on the basis of age group

| Age Group | Study Population | | | |
|-----------|------------------------|-------|---------------------------|-------|
| | With cervical abrasion | | Without cervical abrasion | |
| 15 - 25 | 0 | 0% | 272 | 60.7% |
| 26 - 35 | 3 | 5.8% | 103 | 23.0% |
| 36 - 45 | 8 | 15.4% | 47 | 10.5% |
| 46 - 55 | 21 | 40.4% | 14 | 3.1% |
| 56 - 80 | 20 | 38.5% | 12 | 2.7% |
| Total | 52 | 100% | 448 | 100% |

In the present study, 67.3% of males and 32.7% of females were seen to have cervical abrasion among the population with cervical abrasion. The difference in prevalence between males and females was found to be statistically significant (p<0.05) (Table 2).

Among the population with cervical abrasion, patients who brushed twice a day (78.8%) were observed to have more cervical abrasion than those who brushed once a day (21.2%) (Table 2). Similarly it was also observed that amongst the population who brushed twice a day, 49% of them were using medium or hard toothbrush and 46% had no knowledge of the type of brush they were using (Table 3).

Table 2: Distribution of the study population

| Predictor variables | | Study Population | | | p-value |
|---------------------|------------|------------------------|---------------------------|-------|---------|
| | | With Cervical Abrasion | Without Cervical Abrasion | Total | |
| Sex | Male | 35 | 145 | 180 | 0 |
| | Female | 17 | 313 | 320 | |
| Brushing Frequency | Once | 11 | 175 | 186 | 0.011 |
| | Twice | 41 | 273 | 314 | |
| Brushing Stroke | Horizontal | 44 | 422 | 466 | 0.009 |
| | Vertical | 8 | 26 | 34 | |
| Hypersensitivity | Present | 52 | 1 | 53 | 0.001 |
| | Absent | 0 | 447 | 447 | |
| Total | | 52 | 448 | 500 | |

Table 3: Distribution on the basis of type of toothbrush among people with cervical abrasion with brushing frequency twice

| Type of toothbrush | Number of People | Percentage of People |
|--------------------|------------------|----------------------|
| Soft | 2 | 5% |
| Medium | 18 | 44% |
| Hard | 2 | 5% |
| Don't Know | 19 | 46% |
| Total | 41 | 100% |

Likewise, the study revealed that the stroke of brushing also played an important role in the formation of cervical abrasion. Patients brushing with horizontal strokes (84.6%) were observed to have higher prevalence of cervical abrasion (Table 2). The study showed that of the total population with cervical abrasion 96.2% were on mixed diet whereas 3.8% were vegetarians.

Out of the total patients examined only 1% were from the rural area. Hence the relation between area of residence and prevalence of cervical abrasion was not computed as the survey data did not have significant patients from rural area.

With regards to hypersensitivity, the study revealed that all patients with cervical abrasion had hypersensitivity. This was found to be statistically significant ($p < 0.05$) (Table 2).

DISCUSSION

This study sought to find the prevalence and distribution of cervical abrasion in our patient population and analyze if there was any association with the patient's characteristics, and oral hygiene or dietary behavior. The overall prevalence of cervical abrasions in the present study was reported to be 10.4 % which is higher than 6.1% as reported by David K, however lower than Saxena V (68.6%) and Borcic J (60-70%).¹³⁻¹⁵

The study showed a significantly higher prevalence of cervical abrasion among the older people, 46 years and above. The finding of this study was consistent with findings of Bartlett et al and Mithra N. Hegde and Nireeksha.^{12,16} which reported that prevalence of tooth wear upsurge with age. The reason behind the increase in cervical abrasion with age may be that etiological factors over the period of time have cumulative effect on hard tissues that resulted in increased severity and loss of tooth surface.¹⁷

The study revealed a significant increase in cervical abrasion in males in contrary to females; 67.3% of males and 32.7% of females. Hedge et al.¹⁸ and Bader K et al¹⁹ also showed similar results. This could be related to intense muscle mass and muscular strength among males which may be contributing factors to heavy masticatory forces in them.²⁰ While females tends to

be more concerned about their oral health and tend to get regular dental check-ups done and adopt preventive measures.

The study also presented increased cervical abrasion in patients taking mixed diet (96.2%) compared to vegetarian diet (3.8%) which was found to be supported by previous studies.^{12,18,19} One study conducted by Bartlett DW showed no correlation between tooth wear and dietary intake.¹⁶

Patients who brushed twice a day (78.8%) showed increased wear rates than patients who brushed once a day (21.2%). This was consistent with the study conducted by Nayantara Sud.²¹ In addition to frequency of toothbrushing, the method of toothbrushing and type of toothbrush bristle had significant role in formation of cervical abrasion. Subjects employing horizontal toothbrushing techniques and using toothbrush with medium or hard bristle were seen to have cervical abrasion.

With regards to sensitivity, the study revealed that all patients with cervical abrasion had hypersensitivity. Hypersensitive cervical abrasion is considered to be a common dental complaint.²²

CONCLUSION

The cervical abrasion which is seen as non-cariogenic origin has been commonly observed in clinical practice. It causes significant loss of tooth structure resulting sensitivity. This type of lesions is seen to produce level of difficulty during treatment. The specific cause of this entity has always been an area of conflict. In this study, the prevalence of cervical lesions was observed in 10.4% of the survey population. The prevalence was seen higher among males as compared to females. Similarly, the prevalence was higher in older age groups. Type of toothbrush bristle and brushing technique were notably associated with the occurrence of lesions. Hence, it is highly recommended that people be guided by dental professionals on correct brushing technique and use of appropriate type of toothbrush to avoid this problem and prevent it from worsening.

CONFLICT OF INTEREST: None

FINANCIAL DISCLOSURE: None

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