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ORIGINAL ARTICLE

PREVALENCE OF ROOT CARIES AND PERIODONTAL DISEASES IN ADULT AND OLDER PEOPLE RESIDING IN IMADOL, LALITPUR, NEPAL

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ABSTRACT:
Background: Increased life expectancy and improved oral health conditions may increase in the number of adults and the elderly with higher proportions of preserved or retained teeth and, subsequently, greater exposure to periodontal disease and root caries. Till to date and to our knowledge, the data for root caries for elder population is not obtained for Nepalese population. Thus the aim of this study is to determine the prevalence of periodontal status and root caries in adults and elder people of Imadole, Lalitpur, Nepal. **Methods:** A cross-sectional study was carried out among the conventional sample of 102 people of 35 years and above attending oral health screening camp. Periodontal status was recorded using Russell's Periodontal Index (Russell A. L. 1956) with the help of mouth mirror and non calibrated periodontal probe. Root caries was recorded using Root Caries Index (Ralph V Katz in 1979) with mouth mirror and dental explorer. **Results:** The mean number of teeth with gingival recession per subject was 10±7.06. The mean RCI score was 6.49±16.42 (range 0-80). The prevalence of root caries was 25.88%. Maximum number of the participants had established destructive periodontal disease (n=46, 45.1%) while only few numbers of the participants had clinically normal supportive tissues (n=7, 6.9%). Tobacco users had more periodontal disease than non tobacco user. **Conclusion:** High prevalence rates of root caries have been observed among older adults in recent times. The data on root caries prevalence obtained in this study will serve as a reference for further studies.
Key words: Periodontal Disease, Russell's Periodontal Index, Root Caries, Root Caries Index.

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INTRODUCTION:

Periodontal disease and root caries are a group of closely related conditions that manifest in all ages. Periodontitis exhibit radiographic bone loss and clinical attachment loss, and can be localized or generalized.[1] Gingivitis and chronic periodontitis are the most common periodontal diseases affecting older adults. Approximately 31% of Nepali age 35-44 had deep periodontal pockets which ranks Nepal as one of the top 15% of the countries in the world where this age group suffers from deep periodontal pocketing.[2] Epidemiological studies show that poor oral hygiene or high levels of dental plaque are associated with high prevalence rates and severity of periodontal disease.[3] Another common oral problems encountered in elder population is root caries. "Katz et al "has defined root caries lesion as soft, progressive, destructive lesions, either totally confined to the root surface or involving undermining of enamel at the cemento-enamel junction but clinically indicating that the lesion initiated on the root surface.

Increased life expectancy and improved oral health conditions may increase the number of adults and the elderly with higher proportions of preserved or retained teeth and, subsequently, greater exposure to periodontal disease and root caries. Gingival recession is a common event in adults and the elderly, a necessary condition for demineralization of the cementum and root dentin, which are less mineralized than the enamel. They are, therefore, more vulnerable to caries, possibly culminating in the appearance of root caries. For all of these reasons, there is a

trend for root caries to be an oral health problem for public health in the future.[4]

Thus the aim of this study is to determine the prevalence of periodontal status and root caries in elder people of Imadole, Lalitpur. This study also identified the risk factors for periodontal diseases among these elderly.

METHODOLOGY

A cross-sectional study was carried out among the conventional sample of people of 35 years and above attending oral health screening camp at Krishna Pranami Temple, Imadole Lalitpur. Ethical approval was taken from institutional review board. After taking informed consent, a questionnaire was delivered among the patients coming to the screening camp who were the resident of Lalitpur, Nepal. The age chosen is the standard age for monitoring periodontal health condition for adults. Full mouth examination was done under portable LED headlight. Periodontal status was recorded using Russell's Periodontal Index (developed by Russell A. L. 1956) with the help of mouth mirror and non calibrated periodontal probe. Root caries was recorded using Root Caries Index (developed by Ralph V Katz in 1979) with mouth mirror and dental explorer. Community periodontal Index (CPI) probe was used to verify the presence of gingival recessions in millimeter (distance from cement-enamel junction to the gingival margin) at the midbuccal, mesiobuccal, distobuccal and midlingual surfaces. The complete intraoral examination was carried out by a single examiner who was previously trained and calibrated. Intraexaminer reliability was assessed using Kappa statistics which was 0.91 for PI and 0.83 for RCI.

RESULTS:

This is the first study to present information on prevalence of root caries among the adult and older Nepalese population. Periodontal health status and gingival recession of the people were also determined. The mean age of the patients participating in this study was 51.91±12.93 with a range of 35 to 92 years. Among 102 subjects in this study, 63 (61.8%) of the participants were female and 39 (38.2%) were male. All the patients were from Lalitpur district where this study was conducted (Table 1).

Forty of the participants (39.2%) were suffering from one or more chronic medical conditions and were under medications. The most common medical condition was hypertension (n=16, 15.7%) followed by diabetes mellitus (n=7, 6.9%). Commonly practiced stroke for cleaning teeth was mixed stroke (n=51, 50%). Most of the participants used toothpaste and toothbrush for cleaning teeth (n=96, 94.1%). Sixty six of the participants (64.7%) were cleaning their teeth once a day, while almost thirty percentage of the population were cleaning their teeth twice a day. The most common timing of cleaning teeth was before breakfast (n=79, 77.5%) followed by after lunch (n=13, 12.7%). A percentage of 11.8 (n=12) of the participants were tobacco users. The mean number of missing teeth per subject was 3.85±4.78 range (0- 21). The mean number of teeth with gingival recession per subject was 10±7.06. The mean RCI score was 6.49±16.42 (range 0-80). The prevalence of root caries in this population was 25.88%. (Table I)

Scores of Rusell's Periodontal Index are described in Table II. The mean number of teeth with healthy gingival tissue per subject was 5.90±8.48 whereas the mean score of the most severe condition of periodontal structures (advanced destruction with loss of masticatory function) per subject was 0.44±1.79. The result showed that maximum number of the participants had established destructive periodontal disease (n=46, 45.1%) while only few numbers of the participants had clinically normal supportive tissues (n=7, 6.9%). (Table II)

More number of the tobacco user had established destructive periodontal disease (50%, n=6) followed by terminal periodontal disease (33.3%, n=4). None of the tobacco users had healthy gingival tissue. (Table III). However, the influence of medical condition and oral hygiene habits on periodontal status could not be established in this study.

Table I. Characteristics of the study sample and condition of their root surfaces (n = 102).

Variables	Value
Age (years)	51.91±12.93
Mean number of missing teeth	3.85 ± 4.78
Mean number of teeth with gingival recession	10 ± 7.06
Mean Root Caries Index score (%)	6.49 ± 16.42
Prevalence of Root caries (%)	25.88%.

Table II. Russel's periodontal score

Scoring criteria	Mean value	Clinical condition of periodontal tissue	Percentage
0- Negative Findings	5.9±8.48	Clinically normal supportive tissues	6.9%
1- Mild Gingivitis	9.13±9.15	Simple gingivitis	13.7%
2- Gingivitis Circumscribing Whole Tooth	7.06±8.60	Beginning destructive periodontal disease	27.5%
6- Gingivitis with Pocket Formation	5.24±5.35	Established destructive periodontal disease	45.1%
8- Advanced Destruction with Loss of Masticatory Function	0.44±1.79	Terminal disease	6.9%

Table III. Influence of tobacco on clinical periodontal condition

Tobacco habit	Clinically normal supportive tissues	Simple gingivitis	Beginning destructive periodontal disease	Established destructive periodontal disease	Terminal disease	Total
Yes	0(0%)	0(0%)	2(16.7%)	6(50%)	4(33.3%)	12(100%)
No	7(7.8%)	14(15.6%)	26(28.9%)	40(44.4%)	3(3.3%)	90(100%)
Total	7(6.9%)	14(13.7%)	28(27.5%)	46(45.1%)	7(6.9%)	102(100%)

P value: 0.002

DISCUSSION:

This cross sectional study is the first attempt to know the prevalence rates of root caries among adult and older Nepalese population.

Globally, individuals are retaining a greater number of teeth into old age than before. This have resulted high caries experience in both coronal and root surfaces. Similarly, high prevalence rates of periodontal diseases have been observed among older adults in recent times.[5] With regards to the prevalence of root surface decay, mean decayed/filled root surface criteria could not represent the relationship between the root caries and gingival recession. Therefore RCI is often used to describe root caries nowadays.[6]

Various factors like oral hygiene maintenance, use of fluoride and tobacco have important impact on the outcome of periodontal health and dental caries. In this study, around 65% of the participants cleaned their teeth once a day and almost 30% cleaned their teeth twice a day. It is widely believed that brushing twice a day reduces a significant number of caries in oral cavity. In a study carried out by Pushpa Thapa et al. only 9.9% of the participant cleaned their teeth twice a day. Similarly use of fluoridated tooth paste is higher among the participants in this study (94.4%) compared to the study done by same author (71.4%). [7] This difference could be due to the fact that the participants here mostly belong to urban area. Another etiological factor for periodontal disease is tobacco use and it was common among 11.8% of the participants. The prevalence of root caries in this study population is 25.88% which is lower than the prevalence of elder population in India.[8] Root surface caries of older population of Srilanka is also higher (90%) compared to the findings of our study.[5] Similarly, the percentage of subjects with root caries was higher (39%), in a study conducted in Japan.[9] These differences could be due the differences in age as our population consists of both adult and older people. Worldwide, the prevalence rates range from 7.9 to 69.3%.[10] The mean Root Caries Index Score was 6.49±16.42. Similarly, on an average, in this study, an individual had 3.85±4.78 number of missing teeth. Both findings were lower than the previous studies.[1,6] Mean number of teeth with gingival recession was 10±7.06. This finding was higher than the findings of Camargo et al[1] and lower than the finding of Kularatne and Ekanayake.[5] The differences in the findings could be due to variation of distribution of etiological factors in the study samples.

Around 45% of the population had established destructive periodontal disease. Many epidemiological studies have shown that globally people with deep pockets range from approximately 5 to 70%.[3] In a study done by Philip et al, 73.6% of people age 35-44 years had periodontal disease and 23.8% of the population had severe periodontal disease.[11]

Among, age, gender, medical history, brushing habits and tobacco use; only the association between tobacco use and periodontal disease was significant. Tobacco was shown as an important etiological factor in many previous studies.[1, 11, 12] Wide range of mean age and limited number of study subjects are the limitations of this study. However, this study provides the much needed data to conduct the study on prevalence of root caries among Nepalese population. Different risk indicators of root caries like age, use of fluoride, educational level, use of dental services can also be studied in this population in future.

CONCLUSION:

Gingivitis and chronic periodontitis are the most common periodontal diseases affecting older adults. Similarly, high prevalence rates of root caries have been observed among older adults in recent times. Till to date and to our knowledge, the data for root caries for elder population is not obtained for Nepalese population. The data on root caries prevalence obtained in this will serve as a reference for further studies.

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