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Correlation between Risk Factors and Prevalence of Root Caries among Elderly Individuals Attending Dental College

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Abstract

Introduction: Root caries is one of the most common and significant dental health problem among older adults today. Over the years, root caries has been the major reason for tooth loss in older adults, and has negative impact on oral health related quality of life in elderly individuals. *Aim*: The study was done to assess the prevalence and risk factors associated with root caries among elderly individuals attending I.T.S Dental College Greater Noida. *Materials & Methods*: A total sample of 380 individuals aged from 65-74 years old who attended the dental college of Greater Noida were included in the study. A face-to-face interview using a prevalidated structured questionnaire was conducted to collect the information of the subjects including their demographic characteristics were recorded. The prevalence of root surface caries was evaluated using the Katz Index. Chi square test and Logistic regression analysis was used for statistical analysis. *Results*: The prevalence of root caries in our study population was found to be 45.7%. Risk factors included smoking, dryness of mouth, tobacco chewing were significantly associated with root caries. *Conclusion*: The study concluded that root caries prevalence was high in the elderly individuals, . Factors including demographic variables e.g: age, gender and deleterious habits including smoking, tobacco chewing and alcohol consumption had a definite impact on the prevalence of root caries.

Keywords: Prevalence; Root Caries; Risk Factor; Root Caries Index; Elderly Individuals.

Introduction

In the coming next four decades, United Nations Population Division estimates the elderly individuals in indian population will rise dramatically from 8 to 19 %. By the mid of 21st century, population of elderly individuals who aged beyond 60 years is more than population of united states in 2012. This profound shift among the elderly individuals in indian population brings variety of challenges [1]. In the last two years, root caries is common clinical problem faced by the elderly individuals [2]. A number of studies done in the worldwide reportedly found the high prevalence of root caries in elderly individuals.

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[3-6].A number of Risk factors including socio-demographic factors, xerostomia has been noted which can compromise the older's adult health.[7]Many dental practitioners face a challenge to provide good oral health care to older's patients. Tooth loss is chief oral health related variable which has negative impact among elderly indviduals and it is a major reason for tooth loss in them [8].

Hazen et al defined the root caries as a soft, progressive, destructive lesion which is either totally confined to the root surface or involving undermining of enamel at the cemento-enamel junction but clinically indicating the lesion initiated on the root surface [9]. In recent years, increasing in oral health awareness and recent advances in treatment modalities which helps the patients to retain their natural teeth in old age. As age progresses, they are more susceptible to periodontal problems like gingival recession which even made them more vulnerable to root caries [10].

Few studies have been done in Indian population regarding the prevalence of root caries. However, none of the studies have mentioned the association of risk factors with root caries. Thus it is necessary to have the study based on the risk factors which affecting the prevalence of root caries. The present study was done to assess the prevalence and risk factors associated with root caries among elderly individuals attending I.T.S Dental College Greater Noida. The study also examined the association of risk factors with the root caries.

Materials and Methods

A descriptive type of epidemiological study was carried out among the patients who aged 65-74 years attending O.P.D of I.T.S Dental College & Hospital Greater Noida, India.

Pilot Study

Sample size was determined by conducting a pilot study among 50 elderly individuals attending outpatient department of Public Health Dentistry. Prevalence rate obtained by doing pilot study was 41.9% and sample size was estimated by the formula : $4pq/L^2$, hence the sample (n) calculated from the pilot study was 380.

Ethical Clearance

The ethical clearance letter was obtained from Instituional Review Committee of Dental college.

Consent Form

A signed consent form was obtained from the patients or their guardian prior to the study, a consent form was available in Hindi & English for the better understanding of the study. A study procedures were fully explained by the examiner to the patients or guardian.

Inclusion Criteria

Patients who aged from 65-74 years were included in the study, Patients who agreed & completed the questionnaire were included in the study.

Exclusion Criteria

Incomplete questionnaires during collecting the data, Patients who were not willing to participate in the study and not giving consent for the same purpose.The third permanent molars are excluded from the present study.

Questionnaire

An open ended questionnaire was used for collecting the demographic characteristics of patients including name, age & gender of the patient and behavioural characteristics of patients including number of dental visits of patients, brushing techniques, sugar consumption. The patients were also being asked about their habits of smoking & alcohol.

Clinical Examination

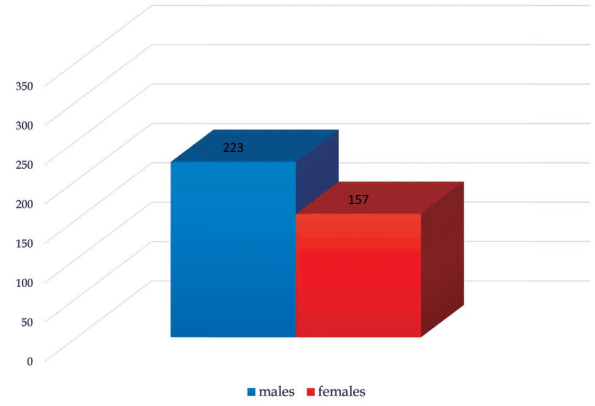
The examination of root caries on patients done by using mouth mirror and exploratory probe on dental chair by a single examiner.The reliability of the index was tested and calculated by obtaining kappa value which was 0.89. Assessment of root caries done by using root caries index (Katz Index) [11].

Statistical Analysis

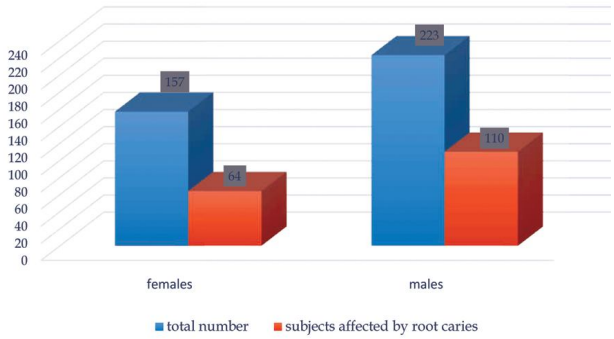
Collection of data was done in Microsoft excel software. Chi square test was used for the association of the variables. Logistic regression was used for the correction of the variables. The level of significance was set at 0.05 and SPSS 21.0 version was used for statistical analysis.

Results

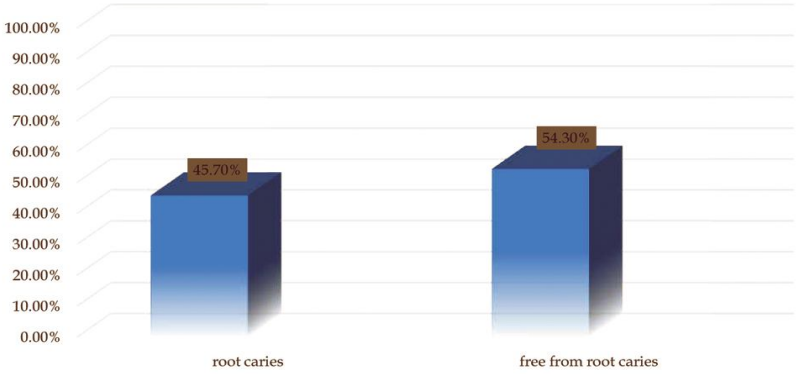
A total of 380 elderly patients (223-females, 157-males) with age range from 65 to 74 years were



Graph 1: Gender wise distribution of elderly patients in the study population



Graph 2: Gender wise distribution of root caries in the study population



Graph 3: Prevalence of root caries in the study population

Table 1: Association of root caries with various factors in elderly population

Independent variables		N	Root caries present	Percentage of respondents with RCI
Age	65-74 years	380	174	45.7%
Gender	Males	157	78	49.6%
	Females	223	96	43%
Smoking	No	167	107	64.0%
	Yes	213	43	20.1%
Alcohol	No	162	48	29.6%
	Yes	218	81	37.1%
Frequency of tooth brushing	Twice a day	82	26	31.8%
	Once a day	156	53	33.9%
	Less than once a day	142	68	47.8%
Dental Visits	Yes	213	84	39.4%
	No	163	48	29.4%
Frequency of sugary consumption	High	154	52	33.7%
	Low	226	80	35.3%
Tobacco chewing	Yes	135	89	65.9%
	No	245	90	36.7%
Dryness of Mouth	Yes	134	91	67.9%
	No	246	114	46.1%

Table 2: Logistic regression analysis results for root caries among elderly individuals

Independent variables		OR	p value
Age	65-74 years	3.67	<0.001
Gender	Males	1.13	<0.001
	Females		0.001

Smoking	Yes	2.24	<0.001
	No		0.001
Dryness of Mouth	Yes	3.84	<0.001
	No		0.001
Smoking	Yes	3.19	<0.001
And Tobacco chewing (Males)	No		0.001
	Yes	4.73	<0.001
Tobacco chewing	No		0.001
	Yes	0.67	0.001
Dental Visits	No		<0.001

examined to assess the prevalence of root caries as being mentioned in Graph .1

The prevalence of root caries among the examined elderly population was 45.7%(174 patients), out of which 64 (40.7%) were females and 110 (49.3%) were males which was mentioned in Graph II.

It was found that 380 patients were examined out of them 174 patients were affected root caries, hence the study found the prevalence of root caries among 65-74 years old in the outpatient department was 45.7% (mean 1.1) which is mentioned in Graph 3.

Table 1 represents the association between various factors with the root caries in elderly population using Chi-square tests. Our results found prevalence of root caries were significantly associated with age, gender,smoking, alcohol consumption, tooth brushing frequency, dental visit frequency, tobacco chewing and dryness of mouth.

Table 2 represents the logistic regression analysis for root caries among elderly individuals. It was found that age, females, perceived dryness of mouth, smoking, smoking and tobacco chewing among males and tobacco chewing were significantly associated with the prevalence of root caries.($p<0.05$). The result of multiple logistic regressions shows significantly high prevalence of root caries in the age group of 65-74 years (OR-3.67). Elderly individuals having dryness of mouth, the patients with deleterious habits of smoking, tobacco chewing and among those who had habit of tobacco chewing as well as smoking had a high prevalence of root caries.

Discussion

Though edentulousness is a common problem found in older population, elderly individuals who share their own problems too in the form of root caries which causes lack of functioning activity in the their other remaining teeth.

In our study, the prevalence of root caries in elderly individuals was found to be 45.7%,the findings of this study was closely correspond to the studies done in Japan (39%) [12], China (41%)[13], As Indian population a study done by Bharateesh et al [14] who also reportedly found similar results in prevalence which was 41.9%. In contrast to our finding, a studies done by Kularatne [15], Watanabe [16] found a much higher prevalence of root caries in elderly individuals in Srilanka and Brazil respectively.This finding was similarly found by Joshi [17], Mamai [18] who found the prevalence of root caries in the similar age group around 52% and 40% respectively in New England and Greece respectively.

In our study 62.8% of the elderly individuals had habit of smoking and there was a significant association of root caries occurrence with smoking. This finding is similarly found in the studies done by Mu [13], Bharateesh [14], Kularatne [15]. A longitudinal study done by Solveig et al [19] in 10 years found the significant association in incidence of root caries with daily number of cigarettes.

Our study found the high prevalence of root caries among smokers and tobacco chewers. This finding was similar found in studies conducted by Tomar [20] who found tobacco acts as carcinogenic agent and he also found that tobacco chewing may be a risk factor for root caries.

Our study found the non significant association between frequency of sugary consumption and root caries. However, our analysis were contradicted with the findings done by Rugg Gunn AJ [21], Moynihan [22] who found statistically significant association with the dietary habits and prevalence of root caries.

Limitations

Though the study cannot be generalized in the whole population, as the sample size of our study was small, further studies with higher samples size and variables are required.

Conclusion

It was concluded that the high prevalence of root

caries seen in elderly individuals in the study population. Therefore studies regarding root caries should be conducted more in the Indian population. Factors including demographic variables e.g: age, gender and deleterious habits including smoking, tobacco chewing and alcohol consumption had a definite impact on the prevalence of root caries.

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