

# Root Surface Caries Prevalence In Dakshina Kannada Population

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**Abstract:** *The study aimed to estimate the prevalence of root surface caries in the Dakshina Kannada population. 6000 patients of both gender over 15 years of age were assessed for root surface caries based on clinical examination and structured standardized interview derived from the World Health Organization Oral Health Assessment form 2013. A total of 660 patients (11%) with gingival recession exhibited root surface caries. Males exhibited higher root surface caries 11% than females in the age group of 56 to 65 years of age (36.36%). Intraoral distribution assessment of root surface caries revealed that the molars were most frequently attacked with the buccal surface showing highest presence 32.92%. Correlation between root surface caries and diet, brushing habit and method was also observed.*

**Keywords:** *root surface caries, prevalence, epidemiology, adult population*

## I. INTRODUCTION

Most epidemiological surveys of dental caries in adults have concentrated on assessing coronal carious lesions. Failure to assess and record the presence of root surface caries would understate the prevalence of caries in any population. [1] An increase in the pattern of the prevalence of root surface caries in a population is due to an increase in the age. This pattern is associated with people retaining the dentition for a longer period of time which has led to the teeth especially the root surfaces to get exposed either physiologically or pathologically. [2 – 14] Root surface caries a preventable disease is prevalent and debilitating among the adult population. [2] Various preventive methods employed which are population based may not be effective equally. [15, 16] Intensive root surface caries preventive measures which are office based are more effective in nature but accessibility to such measures may be impossible due to cost factors

especially in the rural areas. There is an increased necessity to understand and identify the risk factors and high risk individuals to steer them towards root caries preventive measures.

This study gives a description of the prevalence of root surface caries in the Dakshina Kannada, Karnataka, Indian population relating the experience to factors such as gender, age, diet, brushing habits, gingival recession, diabetes, tooth attacked and surface involved.

## II. MATERIALS AND METHODOLOGY

The epidemiological survey of 6000 patients from 2014 to 2016 was conducted in the outpatient unit of the Department of Conservative Dentistry and Endodontics, A. B. Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangaluru, India and Satellite Rural Dental

Health Centres of Nitte University. The study was approved by the institutional ethics committee. After obtaining written consent the patients were interviewed. The structured standardized interview consisted of questions based on the World Health Organization Oral Health Assessment form 2013.

**SELECTION CRITERIA:**

Male and female patients aged over 15 years of age were included in the survey. Patients undergoing orthodontic treatment and presenting intellectual disability were excluded from the study.

The patients were clinically examined for root caries on a dental chair subsequent to undergoing scaling procedure under proper illumination after isolation with cotton rolls using a sterile mouth mirror and explorer. The findings were noted by the clinical examiner. The data collected were statistically analyzed.

**III. RESULTS**

TOTAL PATIENTS	PATIENTS WITH ROOT CARIES
6000	660 (11%)

Table 1: Total prevalence of root surface caries

Out of the 6000 patients examined over a period of 3 years, root surface caries was observed in 660 patients (11%).

AGE IN YEARS	TOTAL PATIENTS	PATIENTS WITH ROOT CARIES
15-25	600	0
26-35	840	6 (0.91%)
36-45	1320	75 (11.36%)
46-55	1440	195 (29.54%)
56-65	1200	240 (36.36%)
>65	600	144 (21.82%)

Table 2: Prevalence of root surface caries in different age groups

Highest prevalence of root surface caries was observed in the age group of 56 – 65 years 240 (36.36%).

GENDER	TOTAL PATIENTS	PATIENTS WITH ROOT CARIES
FEMALE	3600	210 (31.82%)
MALE	2400	450 (68.18%)

Table 3: Prevalence of root surface caries based on gender

Males exhibited higher prevalence of root surface caries 450 (68.18%) than females.

LOCATION	TOTAL PATIENTS	PATIENTS WITH ROOT CARIES
URBAN	1440	108 (16.36%)
SEMI URBAN	2520	222 (33.64%)
RURAL	2040	330 (50%)

Table 4: Prevalence of root surface caries based on location

The prevalence of root surface caries was higher in the rural population 330 (50%) when compared to the urban and semi urban population.

BRUSHING FREQUENCY	TOTAL PATIENTS	PATIENTS WITH ROOT CARIES
1	3600	384 (58.18%)
2	2160	99 (15%)
>2	240	177 (26.82%)

Table 5: Prevalence of root surface caries based on brushing frequency

Prevalence of root surface caries was highest among patients brushing once daily 384 (58.18%).

BRUSHING METHOD	TOTAL PATIENTS	PATIENTS WITH ROOT CARIES
HORIZONTAL	3750	72 (10.91%)
VERTICAL	225	45 (6.82%)
HORIZONTAL AND VERTICAL	1995	540 (81.82%)
OTHERS	30	3 (0.45%)

Table 6: Prevalence of root surface caries based on brushing method

Prevalence of root surface caries was higher in patients employing both horizontal and vertical method of tooth brushing 540 (81.82%)

DIET	TOTAL PATIENTS	PATIENTS WITH ROOT CARIES
VEGETARIANS	1440	240 (36.36%)
MIXED DIET INCLUDING FISH	3660	150 (22.73%)
MIXED DIET EXCLUDING FISH	900	270 (40.91%)

Table 7: Prevalence of root surface caries based on diet

Prevalence of root surface was observed to be more in patients following mixed diet but devoid of fish.

DIABETES	TOTAL PATIENTS	PATIENTS WITH ROOT CARIES
YES	1575	471 (71.36%)
NO	4425	189 (28.64%)

Table 8: Correlation between prevalence of root surface caries and diabetic patients

Prevalence of root surface caries was higher in diabetic patients 471 (71.36%)

RECESSION	TOTAL PATIENTS	PATIENTS WITH ROOT CARIES
YES	660	660 (100%)
NO	5340	0

Table 9: Correlation between prevalence of root surface caries and recession

All the patients with root surface caries 660 presented gingival recession.

ROOT SURFACES	MESIAL	DISTAL	BUCCAL	LINGUAL
NO. OF ROOT SURFACES WITH CARIES	930 (30.72%)	867 (28.64%)	996 (32.90%)	234 (7.73%)

Table 10: Prevalence of caries based on the surface of the tooth involved

Prevalence of root surface caries was most observed in the buccal surface 996 (32.90%)

TOOTH NUMBER	NO. OF TEETH WITH ROOT CARIES
11	5 (0.12%)
12	10 (0.24%)
13	282 (6.79%)
14	125 (3.01%)
15	154 (3.71%)
16	315 (7.59%)
17	291 (7.01%)
18	
21	13 (0.31%)
22	9 (0.22%)
23	294 (7.08%)
24	110 (0.26%)
25	113 (2.72%)
26	<b>376 (9.06%)</b>
27	292 (7.04%)
28	
31	88 (2.12%)
32	93 (2.24%)
33	120 (2.89%)
34	55 (1.32%)
35	32 (0.77%)
36	320 (7.71%)
37	219 (5.28%)
38	
41	91 (2.19%)
42	101 (2.43%)
43	20 (0.48%)
44	22 (0.53%)
45	25 (0.60%)
46	280 (6.75%)
47	295 (7.11%)
48	

Table 11: Prevalence of caries based on specific tooth

Maxillary right first molar exhibited the highest prevalence value of root surface caries 376 (9.06%).

#### IV. DISCUSSION

The sample in this study represented the Dakshina Kannada population of both genders aged over 15 years of age. Males exhibited higher prevalence of root surface caries 450 (68.18%) than females. The variation in the prevalence of lesions between males and gender may be due to various factors such oral hygiene habits, diet, general health, dental visit frequency. [2] Relationship between oral disease patterns and oral hygiene has been well established and widely recognized. [17] Incapability to maintain good oral hygiene environment is a major risk factor increasing the risk of root caries especially among the elderly population. [18] An increase in the life expectancy of the human dentition has led to older adults experiencing root caries due to greater permanence of dentition in the oral cavity. [21] In the survey conducted highest prevalence of caries was observed in the age group of 56 to 65 years of age. This has led to a changing

disease pattern. In this study prevalence of root surface caries was most prevalent in patients brushing their teeth only once daily. All the patients with root surface caries 660 presented gingival recession. This finding was similar to various studies which reported that a large proportion of patients with root surface caries presented gingival recession. [1, 21, 22, 23] Various studies have shown a positive association with low indices of socioeconomic status, reduced access to oral health care and prevalence of root surface caries. [18] Prevalence of root surface caries was more in the rural population (50%) than the urban and semi urban population according to this survey.

Diet a very important factor related to caries. The patients in this study were categorized into three groups - vegetarians, non-vegetarians with fish in their diet and non-vegetarians without fish in their diet. Prevalence of root surface caries was less in patients who consumed fish as part of their diet which is accordance with various studies. Fish is a staple diet of the Dakshina Kannada population. Sea food is rich in fluoride and protein which are contributory factors to decrease in caries. [19]

Numerous data in the literature have showed that diabetes is associated with dental disease. Diabetes has shown to increase the risk of developing dental caries. 71.36% of diabetic patients exhibited root surface caries whereas in non-diabetic patients the prevalence was 28.64%. This pattern may be attributed to hyposalivation which is commonly associated with diabetic patients. A significant higher number of caries causing microorganisms are harbored in such an environment. [17]

Analysis of root surface caries according to teeth revealed larger values in the molars which is in agreement with other studies. [22, 23, 24]. Buccal surface of molars present highest prevalence of root surface caries. However, due to absence of radiographs it is difficult to judge which surfaces are most affected, since it is easier to detect root surface caries in the buccal and lingual surfaces than in the proximal surfaces.

#### V. CONCLUSION

Increase in age of population, more the teeth retained and higher the prevalence of root surface caries due to various factors such as untreated caries, diet, oral hygiene maintenance and systemic diseases.

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