Prevalence of Caries on Anterior Teeth in Dakshina Kannada Population

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ABSTRACT

Aim: The main aim of the study was to evaluate the prevalence of caries on anterior teeth of Dakshin Kannada population.

Materials and methods: Two thousand patients were examined for carries in the anterior tooth using mouth mirror and explorer under good lighting facilities, followed by a questionnaire to determine the prevalence of caries on the anterior tooth in Dakshina Kannada population.

Results: It was found that 304 (15.2%) patients had anterior caries out of which the highest incidence was seen among the age of 15–30 years with 17.6% occurrence. It was found that there was a correlation between the time of sugar intake and anterior caries wherein 59.9% of the people consumed sugar in-between meals. Around 142 (46.7%) patients who had anterior caries also exhibited anterior crowding.

Conclusion: Within the limitations of this study, it can be concluded that a strong correlation exists between the occurrence of anterior tooth caries and age, gender, location, dietary habits, and oral hygiene habits. Anterior teeth crowding should also be considered as a risk factor for the development of anterior tooth caries.

Clinical significance: Anterior caries occurs as a result of poor oral hygiene which may be due to improper brushing technique, lack of patient education; unhealthy dietary habits, systemic conditions, and negligence. This study summarizes the changing trends in the prevalence of anterior caries which may be attributed to better oral hygiene maintenance, patient education, and awareness, routine dental check-ups.

Keywords: Anterior teeth, Caries, Prevalence, Trauma.

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INTRODUCTION

Dental caries is considered to be one of the most commonly associated conditions seen worldwide and the main reason for tooth loss, it is considered to be degenerative and infectious in nature[1] and dental caries is said to be a microbiological plaque associated, multifactorial and chronic infection of the oral cavity ultimately leading to the dissolution and disintegration of tooth structure.[2]

The factors that affect dental caries are saliva, microflora, and diet.[3] The cariogenic bacteria that usually affect the oral cavity are streptococci and lactobacilli species which produce organic acid and cause fermentation of carbohydrates.[4] Caries are usually seen in the form of white spot lesion and it is reversible; once it forms cavitation it becomes an irreversible process.[5]

Caries holds three hypotheses: (1) specific plaque hypothesis states that there is only involvement of *S. mutans* and *S. sobrinus*, (2) nonspecific states the involvement of the microflora, and (3) the ecological hypothesis states that caries resultant to change in the environmental condition.[6]

Anterior tooth caries are not commonly seen because of exposure to brushing and variation in the deposition of plaque ,areas with less amount of saliva like the posterior teeth and gingiva of the posterior teeth are usually associated with caries, but if caries do occur it is seen in the area in between the anterior teeth as this area is inaccessible on brushing.

Anterior tooth caries affects the lifestyle and esthetics of an individual and is a greater problem in economic terms compared to posterior teeth.[7] Earliest clinical evidence of dental caries is the white spot lesion which is reversible, cavitation, however, represents irreversible disease.[8] Some areas of enamel surface are more susceptible to demineralization than others as in case of mandibular incisors which are less susceptible to caries since a large amount of saliva is produced by submandibular salivary glands

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whose ducts open behind these. Severe xerostomia predisposes to rapid widespread anterior dental caries.[9]

MATERIALS AND METHODS

This study was conducted on 2000 patients over a period of one month from May 15, 2018, to June 15, 2018, of which 1122 were examined at the outpatient section of department of conservative dentistry and endodontics and 878 were examined in five Rural Health Centers of AB Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangaluru. Permission to conduct the study was sought from the relevant authorities. Informed consents were obtained. Patients were examined for anterior caries after proper isolation of the teeth. A questionnaire was used to gather information on patients general information, medical history, and oral hygiene habits. The assessment consisted of a visual examination using a standard mouth mirror, a sharp ended explorer and supplementary lighting from a dental operatory lamp. Patients were selected based on inclusion and exclusion criteria. Data were recorded on a prepared survey from based on the World Health Organization (WHO) oral health assessment and exclusion criteria were developed.

Inclusion Criteria

- *Age group:* 15–30 years
  31–45 years
  46–60 years
  >60 years.

Exclusion Criteria

- Edentulous patient
- Patient undergoing orthodontic treatment.
- Patients who were unable to complete the questionnaire.

RESULTS

Out of the 2000 patients in this study, 1100 were males and 900 were females. Majority of the patients were from rural areas with a percentage of 43.9%. From this patient pool, it was found that 304 (15.2%) patients were suffering from anterior tooth caries (Table 1).

Out of the 304 patients having anterior teeth caries. The highest incidence was seen in the age group of 15–30 years of age with a 17.6% occurrence. The last occurrence was seen in the age group of >60 years with 10.13% occurrence (Table 2).

Out of the 304 sufferings with anterior caries, 168 were males, and 136 were females. This showed a statistically significant distribution variance amongst the two genders (Table 3).

Table 1: Prevalence of anterior caries in Dakshin Kannada population

Total Population	Absent	Present	Percentage
2000	1696	304	15.2

Table 3: Prevalence of anterior caries in relation to gender

Age group	Frequency	Percentage
Male	66	55.2
Female	136	44.73

Chi-square test	p value
0.01	0.92 (NS)

Table 5: Prevalence of anterior caries with diet

Diet	Frequency	Percentage
Vegetarian	82	26.4
Nonvegetarian	200	65.7
Pescaitarian	22	7.2

Chi-square test	p value
0.99	0.61 (NS)

Table 7: Prevalence of anterior caries with deleterious habits

Deleterious habits	Frequency	Percentage
None	162	54.8
Smoking	58	19
Pan	28	9.03
Tobacco	28	9.03
Alcohol	26	8,55
Other habits	2	0.65

Chi-square test	p value
14.18	0.02*

Out of the 304 patients having anterior teeth caries, 122 were from rural area, 114 were from periurban areas, and 68 were from urban area (Table 4).

Among the 304 patients who had anterior caries 82 were vegetarians and were 200 were nonvegetarians and 22 were pescatarian and it was seen that there is a correlation between time of intake of sugar and anterior caries which was significant of which 122 were the ones who consumed sugar with meals and 182 were the ones who consumed sugar in between meals (Tables 5 and 6).

Among the 304 patients who had anterior caries, 162 had no deleterious habit, 58 had smoking as a habit, 28 had the habit of consuming paan, 28 had the habit of consuming tobacco, 26 had the habit of consuming alcohol and two had other deleterious habits (Table 7).

Among the 304 patients who had anterior caries, 214 used none of the oral hygiene aids, 32 used floss, 34 used oral interdental aids, 24 used mouth rinse (Table 8).

Among the 304 patients who had anterior caries, 142 had anterior crowding, and 162 had no anterior crowding (Table 9).

Among the 304 patients who had anterior caries, 76 had anterior caries involving labial surface, 138 had anterior caries involving lingual surface, 66 had anterior caries involving mesial surface and 24 had anterior caries on the distal surface (Table 10).

Table 2: Prevalence of anterior caries in relation to age

Age group	Frequency	Percentage (%)
15–30 years	66	17.6
30–45 years	124	16.5
45–60 years	86	14.4
>60 years	28	10.1

Chi-square value	p value
8.43	0.04

Table 4: Prevalence of anterior caries in relation to location

Location	frequency	Percentage
Urban	68	22.36
Periurban	114	37.5
Rural	122	40.1

Chi-square test	p value
2.16	0.92 (NS)

Table 6: : Prevalence of anterior caries with time of sugar intake

Time of sugar intake	Frequency	Percentage
With meals	122	40.1
In between meals	182	

Chi-square test	p value
17.58	<0.001

Table 8: Prevalence of anterior caries with oral hygiene aids

Oral hygiene aids	Frequency	Percentage
None	214	70.3
Floss	32	10.52
Other interdental aids	34	11.18
Mouthrinse	24	7.89

Chi-square test	p value
28.79	<0.001

Table 9: : Prevalence of anterior caries with anterior crowding

Anterior crowding	Frequency	Percentage
Present	142	46.7
Absent	162	53.28
Chi-square test		p value
1840.84		<0.001

Table 10: Prevalence of anterior caries with surfaces of the tooth that are involved

Surfaces Involved	Frequency	Percentage
Labial	76	25
Lingual	138	45.3
Mesial	66	21.7
Distal	24	7.89
Chi-square test		p value
1962.22		<0.001

Discussion

In many populations, oral disease, especially dental caries and periodontitis, is a widespread problem with considerable biologic, physical, economic, social, and psychogenic consequences. Dental caries is unique not only in terms of pathologic mechanism. Other aspects social and economic, are also worthy of note. As living standards improve the severity of disease usually increases. In industrialized countries, dental caries is one of the most ubiquitous and costly illnesses

The study showed that the total prevalence of anterior caries in Dakshina Kannada population to be 15. 2% out of the 2000 patients examined, this reading is likely to be lesser compared to the study conducted by Hegde et al. which had a prevalence of 24.6%. This may be attributed due to proper oral hygiene care and maintaining an oral aesthetic balance

The current study says that prevalence of anterior caries is more in males 55.2% and females 44.3% but this was not statistically significant, a similar study was done by Demerci et al.[9] in 2010 of which females were 59.1% and males had 40.1%

The studied was also conducted in terms of age which suggested that the maximum prevalence of caries was seen in terms of 15–30 years of age around 17.6%. Similar results were reported in studies conducted by Cleaton-Jones and Hugoson where maximum prevalence was seen among the age of 46–55, the signs of anterior caries in early age can be attributed to improper oral hygiene care.[10]

This study also showed the outcome of anterior caries in urban, periurban and rural population suggesting that out of 304 patients who had anterior caries 22.36% were from urban, 37.5% periurban, 40.1% were from rural areas similar studies were conducted by Hegde MN which showed that highest prevalence was seen among. The prime reason for oral disease in rural areas is lack of patient education on fluoride and other brushing and dental adjuncts and socioeconomic status, lack of systemic infrastructure leading to improper screening and diagnosing of the condition.

Ariwala et al. also conducted a study on the same among 1000 patients in 2017 of which 264 people had anterior caries, 127 (48.1%) were from the rural population.[11] A very significant correlation was seen between diet and anterior caries, out of the 304 who had anterior caries, the higher amount of caries rate was seen amongst the nonvegetarians (mixed diet) that is around 65%. This study was dissimilar compared to Khan et al.[12] The following result also indicates that the majority of people who were evaluated in the study were following a mixed diet. Saliva is responsible for the neutralization of acid produced by microorganisms acting on sugar substrate, but when fermentable carbohydrate was not added to the saliva, putrefaction replaced fermentation, alkalinity replaced acidity, and no decalcification is usually observed.[13,14]

The current study states that there is a strong interrelation between anterior caries and oral hygiene aids, caries were commonly seen among 70.3% of those patients who used no oral hygiene aids to maintain oral health therefore to conclude it can be indicated that maintaining better oral hygiene habits helps to reduce anterior caries which was also listed in a study conducted by Petti et al.[15]

Among the 304 who had anterior caries the study showed that there was co-relation between anterior crowding and anterior caries, the current study showed that 46.7% of patients had anterior caries with anterior crowding, whereas study conducted by Ariwala et al. on prevalence of caries on anterior teeth showed that 40.1% of the patients out 264 had anterior crowding.[11] This result indicates that patients with crowding find it difficult in brushing around the interproximal area causing accumulation of debris leading to caries. A study conducted by Buckowska, Szyszka, Woznaik in 2012 indicated that crowding must be taken into the highlight as a caries risk indicator.[16]

Among the 304 who had anterior caries, it was seen that 76(25%) had carries on the labial surface and mesial was 66 (21.7%) and distal was 24 (7.89%) and lingual was 138 (45%) and the result was statistically significant.

Conclusion

Within the limitations of this study, it can be concluded that our study showed an increase in the prevalence of caries on the anterior tooth in males and patients in the younger age group (15–30 years) and the rural population. A relationship between dietary habits, oral hygiene practices, and the anterior caries was also found. Moreover, it was found that Lingual surface was more susceptible to anterior caries and crowding had no interrelation with anterior caries

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