PREVALENCE OF ANTERIOR TEETH CARIES IN DAKSHINA KANNADA POPULATION-2017

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ABSTRACT

The objective of this study was to assess the prevalence of caries in anterior teeth of Dakshina Kannada population based on age, gender, location, dietary habits, occupation, and oral hygiene habits. Other factors such as the prevalence of caries amongst the various anterior teeth, the prevalence of caries between the maxillary and mandibular arch, prevalence of caries among various surfaces of anteriors and the correlation between caries incidence and anterior crowding was also assessed in this study. The present study was conducted on 1000 patients visiting the Department of Conservative Dentistry and Endodontics, A B Shetty Memorial Institute of Dental Sciences, Mangaluru, and Rural Satellite Health Centres of Nitte (Deemed to be University).

Each patient was examined for anterior tooth caries on a dental chair under good illumination using sterilized mouth mirror, explorer and tweezer, while the teeth were isolated using cotton rolls. The patients who had anterior tooth caries were questioned using a standard questionnaire from Oral health survey WHO format 2013, to find its relation associated to age, gender, location, occupation, dietary habits and oral hygiene habits.

It was found that 264(26.4%) patients were suffering from anterior tooth caries. Out of the 264 patients having anterior tooth caries, the highest incidence was found in the age groups of '20-30' with 28.8% occurrence. It was found that there was a correlation between sugar intake (sweet score) and occurrence of anterior tooth caries, that was statistically significant, where 57.5% of the patients with anterior tooth caries had a daily sugar intake. 106 (40.1%) patients had anterior tooth crowding. This shows a strong correlation between anterior tooth caries and crowding, although not statistically significant.

Key words: Anterior Tooth Caries, Prevalence, Dakshina Kannada

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INTRODUCTION

Dental caries is commonly known as tooth decay. It is considered to be the most prevalent oral disease worldwide and the main cause of tooth loss among the population.^[1] Just like any other disease of the body, dental caries is degenerative or infectious in nature.^[2] Dental caries is an infectious, microbiological-plaque related, multi factorial and chronic infection of the oral cavity that results in localized dissolution and destruction of calcified tissues.^[3] The factors enhancing the progress of dental caries are found to be dietary carbohydrates, saliva, oral microflora, and susceptible tooth surfaces.^[4]

At least two major groups of bacteria, namely the *Streptococcus mutans* and the *Lactobacilli* species, are able to produce organic acids during metabolism of fermentable carbohydrates and are referred to as cariogenic bacteria.^[5] Caries is known to develop in the form of a white spot lesion which is reversible. But, as it progresses to cavitation, it becomes an irreversible disease.^[6]

Anterior teeth are not likely to be the most popular place for cavities forming. This is because some sites in the mouth collect more plaque than others: places with insufficient saliva presence-like molars and premolars; gingiva of the back teeth and so on. But as far as anterior teeth are concerned, usually they are easy to clean and floss, preventing the accumulation of plaque. But if a cavity does occur, it can be found in between the front teeth, as this space is quite difficult to clean properly. Anterior teeth caries has been found to affect quality of life as it affects aesthetics and is found to be a greater burden economically as compared to posterior teeth.^[6] Thus, the purpose of the study was to determine the prevalence of anterior teeth caries in Dakshina Kannada population.

MATERIALS AND METHODS

The study was conducted on 1000 patients from the outpatient department of Conservative Dentistry and Endodontics as well as the Satellite Rural Health Centres of A. B. Shetty Memorial Institute of Dental Sciences, Nitte (Deemed to be University), Deralakatte, Mangaluru. Informed consent of the patient was obtained prior to initiating the study. A questionnaire was designed to ask the patient's history related to caries. The patients were examined for anterior caries on a dental chair using a No. 17-23 explorer and a No. 5 mouth mirror with the cotton roll isolation technique and good illumination. WHO criterion for caries detection was followed and the findings were recorded and entered into the questionnaire by a trained dental professional. All the data was then coded and processed utilizing the Statistical Package for Social Sciences software for statistical analysis and difference between variables were analysed using Pearson Chi-Square Test.

Results:

Out of the 1000 patients evaluated in this study, 523 patients were male while 477 were female. Majority of the patients were from rural areas, with a percentage of 49.6%. From this patient pool, it was found that 264(26.4%) patients were suffering from anterior tooth caries.

Table 1: Prevalence of anterior tooth caries in Dakshina Kannada population

TOTAL POPULATION	ABSENT	PRESENT	PERCENTAGE OF ATC
1000	736	264	26.4

Out of the 264 patients having anterior tooth caries, the highest incidence was found in the age groups of '20-30' with 28.8% occurrence and '40-60' with 28.4% occurrence. The least occurrence of anterior tooth caries was found in the '>60' age group with 7.1% occurrence.

Table 2: Prevalence of anterior tooth caries in relation to age

AGE GROUP	FREQUENCY	PERCENTAGE
<20 years	24	9.1
20-30 years	76	28.8
30-40 years	69	26.1
40-60 years	75	28.4
>60 years	20	7.6

Out of the 264 patients found to be suffering with anterior tooth caries, 58.3% were males while 41.7% were females. This showed a statistically significant distribution variance amongst the two genders. (p value=0.022)

Table 3: Prevalence of anterior tooth caries in relation to gender.

GENDER	FREQUENCY	PERCENTAGE
MALE	154	58.3%
FEMALE	110	41.7%

Out of the 264 patients found to be suffering with anterior tooth caries, 48.1% were from rural areas while 17% were from urban areas.

Table 4: Prevalence of anterior tooth caries in relation to location

LOCATION	FREQUENCY	PERCENTAGE
URBAN	45	17%
PERI-URBAN	92	34.8%
RURAL	127	48.1%

Out of the 264 patients found to be suffering with anterior tooth caries, 80.3% were on a mixed diet while 19.7% were on a vegetarian diet. It was found that there was a correlation between sugar intake (sweet score) and occurrence of anterior tooth caries, that was statistically significant. 57.5% of the patients with anterior tooth caries had a daily sugar intake, while 42.5% had no sugar intake daily.

Table 5: Prevalence of anterior tooth caries in relation to dietary habits

DIET	FREQUENCY	PERCENTAGE
VEGETARIAN	52	19.7%
MIXED	212	80.3%

Table 6: Prevalence of anterior tooth caries in relation to sugar intake

SUGAR INTAKE	FREQUENCY	PERCENTAGE
NONE	112	42.4%
ONCE DAILY	102	38.6%
MORE THAN ONCE	50	18.9%

Out of the 264 patients suffering with anterior tooth caries, 40.9% were patients working in the skilled sector and 17.4% were homemakers. Patients who brushed once daily had a higher incidence (59.8%) of caries as compared to patients who brushed twice (38.6%). It was also found that 61% of patients who did not use any other aids such as mouthwash, floss etc. had anterior tooth caries.

Table 7: Prevalence of anterior tooth caries in relation to oral hygiene habits

BRUSHING FREQUENCY	FREQUENCY	PERCENTAGE
1	158	59.8
2	102	38.6
More than 2	4	1.5

Prevalence of anterior tooth caries between arches and among various tooth surfaces: In this study, it was found that 92.1% of the teeth affected, that is 243 patients, belonged to the maxillary arch. Amongst the various tooth surfaces, the mesial surface was the most commonly affected region, with an incidence rate of 47.5%. The lingual surface, with an incidence rate of 4.1%, was found to be the least affected region.

Table 8: Prevalence Amongst Various Tooth Surfaces

TOOTH SURFACE	FREQUENCY	PERCENTAGE
FACIAL	66	21.5
LINGUAL	13	4.1
MESIAL	145	47.5
DISTAL	82	26.8

Correlation between anterior tooth caries and anterior crowding: Out of the 264 patients with anterior tooth caries, 106 (40.1%) patients had anterior tooth crowding. This shows a strong correlation between anterior tooth caries and crowding, although not statistically significant.

Discussion:

The study found the overall prevalence of anterior caries within the Dakshina Kannada region to be 26.4%, out of the 1000 patients evaluated. This value was found to be slightly higher as compared with a study conducted by Mithra Hegde et al (2014), which found a prevalence of 24.65%. The present study found that the prevalence of caries was more in males than females in the same population, which is similar to the findings of Mithra Hegde et al. ^[6]

The assessment of anterior carious teeth among the various age groups was also determined. This study found that the maximum prevalence of carious anterior teeth was seen within the age groups of 21 to 30 years and 41 to 60 years of age. This was in accordance with results recorded in studies conducted by Cleaton Jones and Hugoson. ^[7]

A strong interrelation was seen between the vegetarians, non-vegetarians (mixed diet) and caries, where 80.3% of the carious incidence was within the mixed diet group. These findings were dissimilar to the findings of Khan et al. ^[8] This result can be attributed to the fact that majority of the population that was evaluated in this study was that on a mixed diet.

This study also evaluated the prevalence of carious anterior teeth in the urban and rural populations. Out of the 1000 patients examined, 48.1% anterior tooth caries cases were seen in patients at rural centres and from rural areas and 34.8% cases were seen in patients from peri urban areas and 17.1% in

urban areas. Dental diseases in rural India are primarily due to two reasons: socio-economic factors and lack of patient education. There is lack of knowledge regarding use fluoride products and other factors of oral health and hygiene. Systemic infrastructure deficiencies exist within the rural areas that prevent proper screening and treatment of oral diseases. Hegde MN et al conducted a study with comparable results in 2014.^[6]

This study found that most of the teeth affected within its sample size were from the maxillary arch. Only 7.9% of the carious anterior teeth belonged to the mandibular arch. These results are similar to the findings of Brekhus (1931) who also found that the prevalence of caries in anterior teeth was maximum in the maxillary arch.^[9] A study done by Mustafa Demerci et al proposed that the reason for a low incidence of anterior teeth caries in the mandibular arch is probably due to continuous bathing of the teeth by the saliva secreted by the submandibular and sublingual glands.^[10] Saliva also has a buffering action which helps to prevent the lowering of the oral pH. Since saliva pools in the mandibular arch, it may have a greater influence in this region as compared with the maxillary anteriors.

The present study showed an inverse relationship between the incidence of caries and the frequency of brushing and use of oral hygiene aids. Patients who observed brushing once daily had a higher caries incidence as compared to than those who brushed twice daily and used oral hygiene aids. Therefore, it can be concluded that better oral hygiene habits help to decrease the incidence of caries which was also reported in a study conducted by Petti S Tarsitani G, Panfili P, Simonetti D (1997).^[11]

Out of the 264 patients with anterior tooth caries, 106 (40.1%) patients had anterior tooth crowding. This shows a strong correlation between the occurrence of anterior tooth caries and crowding, although not statistically significant. This result may be attributed to the fact that patients with crowding find it difficult to clean the inter-proximal areas, causing an accumulation of debris leading to caries. A study conducted by Buckowska-Radlinska J, Szyszka-Sommerfeld L, Wozniak K in 2012 concluded that crowding must be taken into consideration as a caries risk indicator.

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. There is also a predilection for occurrence of anterior tooth caries in the maxillary arch and inter-proximal surfaces. Anterior teeth crowding should also be considered as a risk factor for the development of anterior tooth caries.

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