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RESEARCH ARTICLE

PREVALENCE OF CARIES IN ANTERIOR TEETH IN DAKSHINA KANNADA POPULATION

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Abstract

The aim of the survey was to determine the prevalence of caries in the anterior teeth in the Dakshina Kannada population. The basic research design included performance of dental examination based on WHO criteria and questionnaire survey on 4000 patients from the Dakshina Kannada district visiting the outpatient section of the Department of Conservative Dentistry and Endodontics and Rural Satellite Centres of A. B. Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangaluru from 2014 to 2015. The data obtained were statistically analyzed. A significant correlation was deduced between gender, age, diet, oral hygiene habits and caries of the anterior teeth

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Introduction:-

Dental caries as old as humankind is a chronic, infectious disease caused by bacterial by-products that leads to the dissolution of the tooth surface.¹ Dynamic balance between demineralizing and remineralizing factors determines the eventual outcome of dental caries. Demineralizing factors include acidogenic bacteria, inhibited salivary function and frequency of ingestion of fermentable carbohydrates. Dental caries manifests as a continuum of disease states ranging from subclinical atomic level of demineralization to frank cavitation.² Caries is largely preventable by early diagnosis, identification of individual risk factors, patient counselling and education, and initiation of preventive care procedures. The progressive nature of dental disease can quickly diminish the general health and quality of life especially in the case of caries in anterior teeth. Failure to identify and prevent dental disease leads to consequential and long-term adverse effects. Untreated dental disease can compromise the patient's ability to eat, sleep and function well at home and the society. An aesthetic healthy smile in addition to being an important determinant of overall physical aesthetics has been observed to have a considerable bearing on social interaction, playing an important role in how an individual is felt and perceived by others. The unaesthetic nature of untreated anterior carious teeth can also compromise the individual's self-esteem and social development leading to intense psychological repercussions in certain instances. Despite significant achievements in public health programmes individuals still suffer from dental caries and are without basic dental care.³ The infectious dental disease is reversible, if detected early enough. Establishment of a healthy lifestyle, good oral hygiene and nutrition, periodic oral health check-up is of paramount importance to prevent dental caries.

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An insight pertaining to the aetiology of dental caries may be provided from a patient's caries pattern. Hence adequate knowledge and information regarding the prevalence of caries will form the inherent basis for caries prevention programmes and treatment plans. This survey conducted aimed at determining the prevalence of caries in the anterior teeth based on gender, age, location, diet, frequency of oral hygiene measure practiced and surface of the tooth involved.

Materials and Methodology:-

An epidemiological study was conducted on 4000 patients in the year 2014 and 2015 aged above 15 years randomly selected from the outpatient department of A. B. Shetty Memorial Institute of Dental Sciences and satellite rural centres of Nitte University. Subsequent to obtaining permission from the ethical clearance committee of the institute and written consent from the patients a standardized prepared questionnaire based on the WHO Oral Health Assessment form 2013 was filled by the clinical examiner prior to and after the clinical examination.

Inclusion Criteria:-

Male and female patients aged above 15 years of age
Anterior maxillary and mandibular teeth

Exclusion Criteria:-

Patients with intellectual disability
Patients undergoing orthodontic treatment
Edentulous patients
Maxillary and mandibular premolars and molars

Armamentarium used for the examination was sterile mouth mirror, probe, tweezer and cotton rolls.

The patients were examined for anterior caries on a dental chair under adequate illumination. The data collected were analyzed statistically.

Results:-

Table 1:- Total prevalence of caries in anterior teeth

TOTAL PATIENTS		PATIENTS WITH ANTERIOR CARIES	
2014	2015	2014	2015
2000	2000	480 (24%)	402 (20.1%)

Out of the 4000 patients examined over a period of 2 years, caries in the anterior teeth was observed in 480 (24%) and 402 (20.1%) patients in the year 2014 and 2015 respectively.

Table 2:- Prevalence of caries in different age groups

AGE GROUP (IN YEARS)	TOTAL PATIENTS		PATIENTS WITH ANTERIOR CARIES	
	2014	2015	2014	2015
15-25	200	264	10 (02.08%)	9 (02.23%)
26-35	280	424	30 (06.25%)	42 (10.45%)
36-45	440	509	170 (35.42%)	188 (46.77%)
46-55	480	317	155 (32.29%)	96 (23.88%)
56-65	400	308	65 (13.54%)	43 (10.70%)
>65	200	178	50 (10.42%)	24 (05.97%)

Highest prevalence of caries was observed in the age group of 36 – 45 years 170 (35.2%) in the year 2014 and 188 (46.7%) in 2015 followed by 46 – 55 years.

Table 3:- Prevalence of caries based on gender

GENDER	TOTAL PATIENTS		PATIENTS WITH ANTERIOR CARIES	
	2014	2015	2014	2015
FEMALE	1200	919	200 (41.60%)	175 (43.53%)
MALE	800	1081	280 (58.30%)	227 (56.46%)

Males exhibited higher prevalence of caries in anterior teeth 280 (58.30%) and 227 (56.46%) when compared to the female gender

Table 4:- Prevalence of caries based on location

LOCATION	TOTAL PATIENTS		PATIENTS WITH ANTERIOR CARIES	
	2014	2015	2014	2015
RURAL	1247	1341	260 (54.17%)	180 (44.77%)
URBAN	753	659	220 (45.83%)	180 (44.77%)

The prevalence of caries in anterior teeth in the year 2014 was higher in the rural population 260 (54.17%) when compared to the urban population, whereas in the year 2015 the prevalence of caries was 44.7% in both the rural and urban population.

Table 5:- Prevalence of caries based on diet

DIET	TOTAL PATIENTS		PATIENTS WITH ANTERIOR CARIES	
	2014	2015	2014	2015
VEGETARIANS	480	370	150 (31.25%)	127 (31.59%)
MIXED DIET INCLUDING FISH	1220	1430	130 (27.08%)	75 (18.66%)
MIXED DIET EXCLUDING FISH	300	200	200 (41.66%)	200 (49.75%)

The prevalence of caries in anterior teeth was observed to be more in patients following mixed diet but devoid of fish 41.66% in 2014 and 49.75% in 2015.

Table 6:- Prevalence of caries based on brushing frequency

BRUSHING FREQUENCY	TOTAL PATIENTS		PATIENTS WITH ANTERIOR CARIES	
	2014	2015	2014	2015
1	1314	1343	249 (51.88%)	198 (49.25%)
2	712	622	107 (22.29%)	99 (24.63%)
>2	74	35	124 (25.83%)	103 (25.63%)

Prevalence of caries in anterior teeth was highest among patients brushing once daily 51.88% in 2014 and 49.25% in 2015.

Table 7:- Prevalence of caries based on specific anterior tooth

TOOTH NUMBER	NUMBER OF TEETH WITH CARIES	
	2014	2015
11	325 (33.44%)	302 (33.82%)
12	195 (20.07%)	170 (19.04%)
13	15 (01.54%)	17 (01.90%)
21	300 (30.86%)	280 (31.36%)
22	27 (02.77%)	17 (01.90%)
23	6 (00.62%)	7 (00.78%)
31	20 (02.05%)	17 (01.90%)
32	12 (01.24%)	14 (01.57%)
33	4 (00.41%)	6 (00.68%)
41	40 (04.11%)	38 (04.25%)
42	20 (02.06%)	21 (02.35%)
43	8 (00.83%)	4 (00.45%)

Maxillary right central exhibited the highest prevalence of caries 33.44% and 33.82% in 2014 and 2015 respectively.

Table 8:- Prevalence of caries based on the surface of the tooth involved

TOOTH SURFACES	SURFACES WITH CARIES	
	2014	2015
MESIAL	730 (67.97%)	688(66.47%)
DISTAL	285 (26.54%)	321(31.01%)
LABIAL	15 (1.40%)	13(1.25%)
LINGUAL	25 (2.33%)	19(1.83%)
INCISAL	19 (1.77%)	14(1.35%)

Prevalence of caries was most observed in the proximal surfaces, mesial 730 (67.97%), 688 (66.47%) and distal 285 (26.54%), 321 (31.01%) in 2014 and 2015 respectively.

Discussion:-

This study concluded that the distribution of caries was slightly higher in males than females, but not of much significance in contrast with the research conducted by Hegde M N et al ³ and the research conducted by Lukacs J R et al ⁴. The earlier studies attributed the higher prevalence of caries in anterior teeth in females to early eruption of teeth, longer exposure to cariogenic environment, easier access to food supplies and frequent snacking during food preparation.² The decrease in the prevalence of caries among the female population may be due to an increase in the awareness of oral health importance among the rural population. Exposure to various oral health awareness programmes conducted in schools, colleges and in rural satellite dental care centres may also be a contributory factor to the decreased prevalence.

The prevalence of caries in anterior teeth was assessed in various age groups. Out of the 4000 patients examined, prevalence of caries was more in the age group of 36 – 55 years of age. Similar results were recorded in studies conducted by Hegde M N et al³ and Cleaton-Jones et al ⁵.

The prevalence of caries in anterior teeth in the rural population was higher than that of the urban population in the year 2014 whereas in the year 2015 similar prevalence was observed. The higher prevalence of anterior caries in the earlier years corroborated by study conducted by Hegde M N et al may be due to various socio-economic factors, such as lack of knowledge and practice of oral hygiene practices, inadequate infrastructure and facilities available for oral health screening and treatment.⁶ The decrease in the disparity in prevalence of caries in the anterior teeth among the rural and urban population is due to the increase in oral health awareness among the rural population contributed by various oral health awareness programmes conducted by rural satellite centres located in the areas.

A strong correlation was observed between prevalence of caries in anterior teeth, diet excluding fish and diet including fish. Fish is a common part of the diet in population of Dakshina Kannada located in west coast of Karnataka, India. The decreased prevalence of caries in anterior teeth may be attributed to the increased intake of fish which is rich in fluoride and proteins. Proteins in the diet increase the pH in the oral environment due to putrefaction. Hence the population may be protected from dental caries.^{7, 8, 9}

This study showed that the prevalence of caries was dependent on the oral hygiene habits of the population. It was observed that lesser the frequency of brushing higher the prevalence of caries in anterior teeth. Similar results were reported in studies conducted by Hegde M. N. et al³ and Tarsitani et al⁶.

Prevalence of caries was more in the maxillary anterior teeth than the mandibular anterior teeth. This finding may probably be due to the proximity of the mandibular teeth to the submandibular and sublingual salivary gland duct openings. Similar findings were reported by Hegde M. N. et al and Mustafa D. et al. The results of the present study show that the prevalence of caries was most common in maxillary right central incisor followed by the maxillary left central incisor and maxillary right lateral incisor.

Certain areas of the tooth are more susceptible to caries such as pit and fissures and proximal surfaces. Approximal surfaces of the anterior teeth showed the highest prevalence of caries in accordance with the study conducted by Hegde M. N. et al and Mustafa De merci et al.¹⁰ Prevalence of caries was observed more in the mesial surface followed by the distal surface. This may be due to inadequate oral hygiene practices. Proximal surfaces of the anterior teeth are not self-cleansing hence may present as a retention area, thereby promoting caries

Conclusion:-

According to the study conducted it can be concluded that prevalence of caries in the anterior teeth can be strongly correlated with age, location, diet, oral hygiene habits and the surface of the tooth. Association between gender and caries was not observed.

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