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# EPIDEMIOLOGICAL SURVEY ON CARIES IN PREMOLARS IN DAKSHINA KANNADA POPULATION OF INDIA


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**ABSTRACT**

***AIM AND OBJECTIVE:*** *The aim of the epidemiological survey was to assess the prevalence of caries in premolars with respect to, age, gender, site and arch in Dakshina Kannada population*

***MATERIALS AND METHODOLOGY:*** *Thedata was collected from a total of 4000 patients in the year 2014 and 2015 after obtaining their written consent visiting the outpatient unit of the Department of Conservative Dentistry and Endodontics, A. B. Shetty Memorial Institute of Dental Sciences, Deralakatte, Mangaluru and Rural Satellite Centres of Nitte.*

***RESULTS:*** *Out of the 4000 patients that were examined in rural and urban areas, 710 (35.5%) exhibited caries in premolars.*

***CONCLUSION:*** *The present study revealed that the first premolar was commonly affected and with a higher prevalence in maxillary arch than mandibular and 36-45 years agegroup showing the highest prevalence amongst all age groups.*


**KEYWORDS** : *caries, premolars*

## INTRODUCTION

Dental caries is an infectious disease of the teeth, if left unresolved can cause loss of tooth which will affect the physical and mental wellbeing of an individual.[1] Thus to provide the most beneficial treatment in an individual, dentists must be able to assess the presence and severity of all carious lesions and thereby initiate prompt treatment for the same.[1,2] It is for this reason study of caries pattern with respect to different teeth and different surfaces is indeed the need of the hour. Premolars function along with canines and molars toperform both, shearing and tearing as well as grinding the food. They maintain the vertical dimension of face and support the corners of mouth and cheeks to give fullness to face.[3] When all the molars are lost they serve the function of mastication if four to eight occluding premolars are present. If the premolars are lost early it may lead to loss of arch space which can lead to malocclusion. They are also next to molars in terms of importance in mastication, thereforeunderstanding the distribution of carious premolars in the local population is of immense importance, hence the need for the study.[1,3]

## MATERIALS AND METHODOLOGY

The study was conducted in 2014 and 2015 among the Dakshina Kannada population. Ethical clearance was obtained from the institutional ethics committee. 4000 patients visiting the outpatient unit of the Department of Conservative Dentistry and Endodontics, A. B. Shetty Memorial Institute of Dental Sciences, Nitte University and Satellite Rural Centres of Nitte University subsequent to obtaining consent were clinically examined for carious premolar after isolation using sterilized mouth mirror and explorer under good illumination in a dental chair. The patients who presented caries in premolars werequestioned based on the standard questionnaire from Oral Health Survey WHO format 2013 to evaluate the association with age, gender, habits and diet.

## RESULTS

Out of 4000 patients 680 of them had premolar caries with an overall percentage of 34%, with males (54%) beingaffected more than females (46%) (Table 1). Amongst thesepatients who were affected with premolar caries, the distribution of caries in various agegroups aregiven in Table 2.36-45 years of age group exhibited the highest percentage. Amongst all the teeth examined maxillary left first premolar (17.1%) showed the highest occurrence followed by maxillary right second premolar (15.4%) (Table 3). The combined caries effect for individual teeth shows 1st premolars (54.6%) to be highest followed by 2nd premolars (45.4%) (Table 4). When compared with respect to maxillary and mandibular arch more prevalence was seen in maxillary premolars than that of mandible (Table 5). 8.1 % of the teeth showed secondary caries amongst the cases detected with premolar caries (Table 6).

*Table 1: prevalenceof caries in premolars in males andfemales*

| | | FREQUENCY | PERCENTAGE (IN TOTAL POPULATION) |
|---|---|---|---|

| GENDER | MALE | 734 | 54.0 |
|---|---|---|---|
| | FEMALE | 626 | 46.0 |
| | TOTAL | 1360 | 100.0 |

*Table2: Prevalence of caries in premolars in different age groups*

| | GROUPS | FREQUENCY | PERCENTAGE (IN TOTAL POPULATION WITH CARIES IN PREMOLARS) |
|---|---|---|---|
| AGE | 15-25 YEARS | 180 | 13.2 |
| | 26-35 YEARS | 288 | 21.1 |
| | 36-45 YEARS | 346 | 25.4 |
| | 46-55 YEARS | 216 | 15.8 |
| | 56-65 YEARS | 208 | 15.2 |
| | ≥66 YEARS | 122 | 8.9 |
| | TOTAL | 1360 | 100.0 |

*Table 3: Prevalence of caries in different premolars*

| | TOOTH NUMBER | FREQUENCY | PERCENTAGE (IN TOTAL POPULATION WITH CARIES IN PREMOLARS) |
|---|---|---|---|
| TOOTH | 14 | 220 | 14.2 |
| | 15 | 238 | 15.4 |
| | 24 | 264 | 17.1 |
| | 25 | 234 | 15.2 |
| | 34 | 132 | 8.5 |
| | 35 | 176 | 11.4 |
| | 44 | 126 | 8.2 |
| | 45 | 150 | 9.7 |
| | TOTAL | 1540 | 100.0 |

*Figure 1: Distribution of caries in premolars in different teeth*

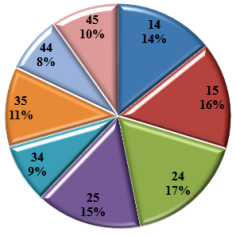


*Table 4: Caries in premolars with respect to first and second premolars*

| | | FREQUENCY | PERCENTAGE (IN TOTAL POPULATION) |
|---|---|---|---|
| TYPE OF PREMOLAR | 1ST PREMOLAR | 742 | 54.5 |
| | 2ND PREMOLAR | 618 | 45.5 |
| | TOTAL | 1360 | 100.0 |

*Table 5: Caries in premolars with respect to maxillary and mandibular arch*

| | FREQUENCY | PERCENTAGE (IN TOTAL POPULATION) |
|---|---|---|
| MAXILLARY PREMOLAR | 778 | 57.2 |
| MANDIBULAR PREMOLAR | 582 | 42.8 |
| TOTAL | 1360 | 100.0 |

*Table 6: Secondary caries associated with premolars*

| | | FREQUENCY | PERCENTAGE |
|---|---|---|---|
| PRESENCE OF SECONDARY CARIES | PRESENT | 110 | 8.1 |
| | ABSENT | 1250 | 91.9 |
| | TOTAL | 1360 | 100.0 |

## DISCUSSION

Individual tooth surfaces have vastly different susceptibilities to caries. Various reasons for the differing caries susceptibilities have been proposed, such as varying tooth surface morphology and post-eruptive enamel maturation of the surfaces.[2,3,4] The caries susceptibility of a tooth surface also varies over time. Information on surface-specific dental caries pattern is a useful source of reference for dental administrators in deciding which preventive strategies to use.[4] Different age groups and populations exhibit distinct caries prevalence rates, observations of which could provide a useful descriptive measure of caries susceptibility in teeth.[4]

In the present study where 4000 patients were examined randomly 1360 patients had caries in one or more premolar teeth. It has been shown in the present study that first premolars are more vulnerable to caries than the second which is in accordance with the study done by Demirci et.al where they concluded that the maxillary first molars had highest caries occurrence amongst all teeth and first premolar showed more prevalence of caries when compared to second premolar, also maxillary arch had higher occurrence compared to mandibular which is similar to the present study.[2,5]Another study conducted by Loto AO showed contrasting results as the study stated occurrence of second premolar caries was more than first premolars showing diverse pattern of distribution across different regions of the world.[6]A study was conducted by Saravanan et.al comparing the pattern of caries in primary dentition where primary second molar showed the highest incidence of caries.[7] The age group of 36-45 years were more affected then the other groups in this study which can be co-related with another study conducted by Mithra N. Hegde et.al where they stated that prevalence of caries in anterior teeth was highest in 36-45 years age group, similar to the present study; they stated that males were affected more than females which is in accordance with the present study, maxillary premolars were affected more as compared to mandibular premolars.[8]Another study was conducted to determine the prevalence of dental caries in premolars and molars of adolescent school children in Ibadan, Nigeria where among the molars, first molars were mostly affected by caries (68.72%) while 31.28% second molars were affected. Second premolars were more affected by caries among the premolars. Also bilateral caries occurrence was highest in the mandibular first molars thus the prevalence of caries differs with respect to different teeth when compared at different ages.[9] About 8% of the patients also showed presence of secondary caries which was in accordance with the study done by Ansari et.al in which secondary caries was highest in second premolar in maxillary jaw.10The type of routine daily dietary habits have a great influence on susceptibility of teeth to carieswhich is in accordance with study conducted by Mithra N. Hegde et.al where they concluded that people on non-vegetarian diet had lesser incidence of caries compared to vegetarian, but people consuming mixed diet had the highest prevalence.[3,8]

In another study conducted by Mithra N. Hegde et.al oral hygiene practices also affected the occurrence of caries amongst the rural and urban population where they stated that oral hygiene practice was in inverse relation with caries occurrence, with lesser in individuals brushing teeth twice daily when compared to once.[11] Another study was conducted by Chestnut et.al where they demonstrated caries susceptibility of individual tooth surface in Scottish adolescents, where pit and fissure caries accounted for 48% of caries prevalence thus showing the importance of tooth morphology in caries prevalence[12].

## CONCLUSION

An epidemiological survey was conducted among 4000 patients. These patients were examined for caries in premolar and comparative evaluation was done to correlate the prevalence of caries in premolars according to age, gender and location, statistical analysis was carried out to correlate the above parameters. Caries was more prevalent amongst 36-45 years age group, with first premolar showing more prevalence then second. Caries was more

in maxillary jaw compared to mandibularamongst 15400 carious teeth in 1360 cases. Also 8% of the cases showed evidence of secondary caries.

**REFERENCES:**


1. Hegde M N,Shetty S; prevalence of caries in premolars in district of south canara population;JIDA 2009vol 3, no.2.
2. Demicri M, Tuncer S and Ayhan A; prevalence rate of caries on individual permanent tooth surface and its distribution by age and gender; Eur J Dent. 2010 Jul; 4(3); 270-279.
3. Shield R C, Gabriela Textbook of dental anatomy; its relevance to dentistry, 8TH edition,2002.
4. Ash & Nelson, wheelers dental anatomy , physiology and occlusion. Las Vegas, michigan 8thedition ,saunders , 2003.
5. Dirks B O. The distribution of caries resistance in relation to tooth surfaces. In: Wolstenholme GEW, Connor MO, editors. Caries-Resistant Teeth.London, Churchill; 22 JAN 2009
6. LotoAO , relative prevalence of caries in first and second premolars; Tropical Dental Journal 1998 dec;21(84):23-6.
7. Sarvanan, Madivanan, Subashini B, Felix JW; Prevalence pattern of dental caries in the primary dentition among school children; Indian J Dent Res. 2006 Jan-Mar;17(1):10
8. Hedge M N, Malhotra A, Hegde N: Prevalence of caries in anterior teeth in adults of Dakshina Kannada Indian population; IJD 01/2013;5(1).
9. DenloyeOO,Ajayi DM; Dental caries prevalence and bilateral occurrence in premolars and molars of adolescent school children in Ibadan, Nigeria; Pediatric Dental Journal; [2005, vol 15(2):147-151].
10. Ansari Z J: Secondary Caries in the Posterior Teeth of Patients Presenting to the Department of Operative Dentistry, ShahidBeheshti Dental School; BeheshtiUniv Dent J 2014; 32(2): 62-68.
11. Dhanya N; Hegde P; Hegde, M N. A cross sectional study of oral hygiene practices and its co-relation to the dental health status in dakshina kannada population; National Journal of Medical and Dental Research 2.2; Jan-Mar 2014: 17-21.
12. Chestnutt I, caries susceptibility of tooth surfaces in adolescents during three year double blind caries trial.2008.