



**PREVALENCE OF MISSING FIRST MOLARS DUE TO CARIES IN DAKSHINA
KANNADA POPULATION**

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ABSTRACT

Introduction: The first permanent molar is exposed to the oral environment for a longer period of time than any other permanent tooth and has deep pits and fissures that are more susceptible to food lodgment, which in turn leads to dental caries and its subsequent loss. The incidence of caries amongst the various teeth varies considerably. The morphology, time of eruption and positioning of the tooth in the oral cavity confer inherited disadvantages or advantages to the various methods used in the control of plaque and hence tooth decay and losses. **Aim:** The Aim of the study was to evaluate the prevalence of loss of first molar due to dental caries in Dakshina Kannada rural, suburban and urban population. **Materials and Methods:** Subjects who had missing first molars were questioned with a standard questionnaire to find the reason for the loss of first molar. A mouth mirror, shepherd's hook probe and adequate illumination were used. The Subjects were evaluated considering their age, gender, occupation, dietary habits and brushing techniques.

KEYWORDS: Missing, first, molar, caries, proximal.

OBJECTIVES

The objectives of the study are to establish the prevalence of missing first molars due to caries based on the following criteria.

- Age of patient
 - Gender of patient
 - Diet of the patient
 - Oral hygiene habits
- We also establish:
- whether supra-eruption of the antagonist tooth has taken place or not,
 - whether adjacent teeth have drifted,
 - if the proximal teeth have also been affected with caries,
 - other reasons for tooth loss.

INTRODUCTION

The first permanent molar is the first tooth to erupt among permanent dentition. Permanent first molar teeth usually erupt when a child is six years of age. At this age, it is the last tooth in the oral cavity and the accessibility and dexterity to maintain the oral hygiene in

that area is difficult for a young child.^[1] Eruption of mandibular molars precede the maxillary molars. The first permanent molar erupts posterior to the second deciduous molar, taking up contact with it. Therefore, first permanent molars are not succedaneous teeth because it has no predecessor.^[2]

Permanent first molar teeth are considered to be the most important permanent teeth because of their numerous roles in the development and maintenance of the occlusion.^[3]

The common questions in many surveys include the amount of tooth loss, the reasons behind extraction and the distribution of tooth loss according to age, gender and tooth type. This survey also notices the presence of proximal caries on the teeth adjacent to the first molar space as in most cases; the carious lesion may not be found confined to only the first molar. Dental caries and periodontal disease are considered the most common reasons for tooth extraction. A number of factors are taken into account during the treatment planning for

carious first molars that include the amount of tooth structure left, maturity of pulp and vitality of tooth.

The role of most important oral masticatory unit in the dental arch is played by first permanent molar.^[4] It is most efficient in chewing food compared to any other tooth in the human dentition with the help of its wide occlusal surface. It also helps in maintaining the facial height, facial growth, anterior-posterior and transverse growth of both jaws.^[5]

Loss of first permanent molars negatively affects both arches and has adverse effects on occlusion. It has been reported that early loss of these teeth results in tilting of neighboring teeth to hollow spaces, supra-eruption of the teeth in the opposite arch, unilateral chewing, a midline shift and dental malocclusion.

The permanent first molar is the most caries-prone tooth in the permanent dentition because of its early exposure to the oral environment.

Understanding the etiology that leads to loss of first permanent molar in a population is important in conducting dental health programs for preventive measures.

Thus the aim of this study was to determine the incidence of the loss of first molar teeth, caries status of adjacent teeth and occlusion analysis in patients of Dakshina Kannada population and to determine the factors which showcase the loss of this tooth.

MATERIALS AND METHODS

Prevalence of missing First Molars details

Variable(v)	Socio-Demographic Total Percentage(%)	Percentage (%) to lose First Molars out of the population that exhibited the Loss.(44.3%)
Gender		
Males	52.3	51.9
Females	47.7	48.1
Age Group		
<20	9.0	8.40
20-30	29.8	27.1
30-40	28.0	31.2
40-60	25.2	26.0
>60	8.0	7.40
Occupation		
Business	7.10	6.80
Service	12.4	12.4
Skilled	40.5	38.4
Unskilled	17.3	17.6
Home-maker	22.7	24.8
Place		
Rural	49.6	49.0
Urban	16.6	17.2
Peri-urban	33.8	33.9

The present study was conducted on 2000 patients to visit the Department of Conservative Dentistry and Endodontics, A. B. Shetty Memorial Institute of Dental Sciences, Mangaluru and satellite rural centers associated with the institution.

Each patient was examined for missing first molars on a dental chair under good illumination using a sterilized mouth mirror, a probe and a tweezer; under isolation.

The patients who had missing first molars were questioned using a standard questionnaire derived from Oral health survey WHO format 2013, to find its relation associated to age, gender, location, occupation, dietary habits and oral hygiene habits. The findings were recorded and entered in the questionnaire.

All the data was then coded and processed utilizing the Statistical Package for Social Sciences software for statistical analysis and difference between variables were analyzed using Pearson Chi-Square Test.

RESULTS

Information collected related to socio-demographic details were gender, age, occupation and place. The result shows, majority of the sample population were males (52.3%); age of the patients were categorized into five categories of less than 20 years, 20-30 years, 30-40 years, 40-60 years and more than 60 years. Occupation was also categorized into five groups of business, service, skilled, unskilled, and housewife. Place was categorized into urban, peri-urban & rural. Maximum number of patients were from the rural area (49.6%).

Personal habits' information collected from the population was based on; diet, brushing with toothpaste and toothbrush or other methods, frequency of brushing, and whether any brushing aids were used in supplementation to brushing. Majority were non-vegetarians (82.7%); 94.2% were using paste and brush for cleaning their teeth; most of them had a habit of brushing once a day (61.2%) and 62.6% of the

population did not use any supplemental aids alongside brushing.

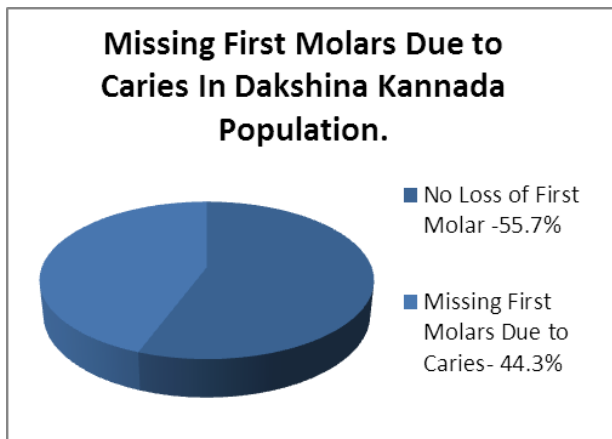
21.2 % of the entire population claimed to smoke, 16.6% consumed alcohol, 9.3% and 6.2% chewed paan and tobacco respectively, while 53.2% of the total population consumed soft drinks on a regular basis.

Habit-based data of the population that had a missing First Molar.

Variable (v)	Percentage(%)
Diet	
Vegetarian	14.7
Mixed	85.3
Brushing type	
Toothpaste and Toothbrush	95.0
Other	5.0
Brushing Frequency	
Once	59.1
Twice	38.4
More than twice	2.50
Brushing Aids	
No Aids	60.9
Flossing	19.0
Mouth-wash	18.7
Both	1.40
Smoking	21.4
Alcohol	16.7
Paan chewing	8.80
Tobacco chewing	6.30
Soft-drinks consumption	52.8

First Molar Loss due to Caries.

Variable(v)	Percentage(%)
Tooth number that has been lost:	
16	8.20
26	8.60
36	8.90
46	18.6
Time elapsed since loss:	
0-6 months	31.3
6-12 months	10.5
12-18 months	2.60
Reason for First Molar Loss	
Caries	87.0
Others	13.0
Supra-eruption of Antagonist Tooth	32.5
Drifting of adjacent teeth	33.1
Caries present on adjacent teeth	
Second premolar	16.5
Second molar	4.70



More importantly, the prevalence of missing first molar in the population was 44.3%, out of which 51.9% were males and 48.1% were females.

Within the age groups, 8.4% of the population below the age of 20 exhibited loss of first molars due to caries. 27.1%, 31.2% and 26% of the population showed a loss of the first molar between the age groups of 20-30, 30-40 and 40-60. 49% of the cases that lost the first molar belonged to a rural area in this survey.

The study showed that out of the 44.3% of population with missing first molars, 36.3% lost their teeth to caries, 7.3% to periodontitis and 0.7% cited their reason as trauma.

DISCUSSION

The prevalence of missing molars in Dakshina Kannada population is 44.3%. Out of 2000 patients examined, 886 patients had missing first molars. The permanent mandibular first molar loss is more commonly seen than maxillary first molar loss. This could be due to the complex anatomy of the mandibular molars as compared to their maxillary counterparts. The presence of intricate pits and fissures on the mandibular molars and their positioning in favor of gravity calls for further food lodgement with these teeth.

According to Hegde *et al*^[6] the loss of first molar is seen significantly from the age range of 36-45 (47.39%) years and increases as the age advances. The present study shows that the main etiology of loss of first molars is due to dental caries. Amongst the 886 cases of missing first molars, 726 cases (36.3%) have shown loss of first molars due to dental caries and 146 patients due to periodontitis. Hence, the study conducted on Dakshina Kannada population revealed dental caries as the most common disease for loss of first molars. Upadyaya *et al*^[7] also confirm that dental caries is the most common cause of extraction of molars in younger age group.

Out of the total 1046 males and 954 females in the population, 460 males (51.9%) and 426 females (48.1%) have missing molars respectively. An association between gender and prevalence of loss of permanent first

molars could not be statistically established ($p=0.830$). Males showed a higher prevalence than females. The increase in loss of first molars in males might be due to adverse habits like smoking, alcohol, tobacco chewing.^[8] Locker D, J. Ford and J. L. Leake^[9] found that males had more predilection of losing one or more than one teeth as compared to females. In contradiction, Shigli K, Hebbal M, Angadi GS^[10] conducted a study and concluded that the loss of first molars is more prevalent in females (26.5%) as a result of dental caries as compared to males (15%).

The prevalence of loss of first molars was more commonly seen in patients from rural areas (49%) as compared to urban areas (17.2%). The reason maybe the fact that patients from rural areas are more negligent towards dental disease as opposed to those that live an urban or peri-urban lifestyle. Based on diet, patients with a mixed diet (85.3%) had shown higher prevalence of loss of molars than vegetarians(14.7%). The reason for this could be the acidic nature of meat-based diets and the inter-dental lodgment of fibers while chewing meat. Based on occupation, the unskilled section showed higher prevalence of loss of first molars. It could be because of the ignorance of dental health and lack of it's awareness.

33.1% of the participants showed drifting of adjacent teeth after the loss of the first molar while 32.5%, showed supra-eruption of antagonist teeth. All teeth in the oral cavity exhibit an innate tendency for mesial migration to close spaces and passive eruption when not countered with a antagonist tooth to maintain occlusion. This study also aimed at detecting the presence of caries on the adjacent teeth; the results of which were, 16.5% on second premolar and 4.7% on the second molar. This indicates that in most cases, carious lesions may not be confined to just the first molar and result in it's loss but the carious lesion could also have spread to the adjacent teeth causing damage to more than one tooth.

Artun and Thalib in 2011 also stated the prevalence of loss of first molar and mesial migration was more common with mandibular teeth(70%).^[11] S. Albadri^[12] *et al* concluded that caries was the main reason for the extraction of permanent first molars in children. It was found that children who attended dental hospitals for extraction of permanent first molars were older than those of optimal age for achieving space closure. Esthetic Dentistry in Clinical Practice.

CONCLUSION

The prevalence of missing first molars due to caries in the Dakshina Kannada district population is 44.3%. The right permanent mandibular first molar loss (18.6% of all cases) is most prevalent. Dental caries is the most common etiological factor for loss of first molar and has shown a scale of 87% amongst all the positive cases pertaining to this study. The prevalence of loss of first molars was higher in rural areas (49%) as compared to

the urban areas. Hence, the need for oral health education and awareness is very crucial amongst the Indian population to prevent such a large-scale loss of teeth very crucial to the occlusion in the oral cavity.

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