Epidemiological Survey on Prevalence of Missing First Molar Due to Caries: A Case Study

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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 also first permanent molars have deep pits and fissures which are more susceptible to food lodgment, which in turn leads to dental caries and its subsequent loss.
The incidence of caries among 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 is to evaluate the prevalence of loss of first molar due to dental carries in south Indian 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. Two examiners accomplished the assessment, and data was described in a proper form.

Results: As per the current study, results showed that the number of males with missing first molar is more than females. Our findings showed that the age group between 15 to 29 years showed a maximum prevalence of 71% of missing first molar. Prevalence of missing first molar was seen less (30.2%) in category of people who had the habit of brushing twice.

Keywords: Dental caries, First molar, Missing tooth, Prevalence, Brushing habit

INTRODUCTION

The first permanent molar is the first permanent tooth to erupt in the oral cavity at the age of 6-7 years. At this age, it is the last tooth in the oral cavity and the accessibility and dextrinity to maintain the oral hygiene in that area is difficult at that age.

This tooth is exposed to the oral environment for a longer period of time than any other permanent tooth, and also first permanent molars have deep pits and fissures which are more susceptible to food lodgment, which in turn leads to dental caries and its subsequent loss.

Studies concerning the epidemiology in dentistry have showed that dental caries and periodontal diseases are the most prevalent pathologies that affect the oral cavity. Previous studies performed by American researchers had suggested that dental caries was the main reason for teeth extraction, and other studies accomplished in New Zealand, Sweden, and even in Brazil confirmed that caries may lead to tooth mortality [1-5].

The incidence of caries among 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. A study conducted in Nigeria showed that the First permanent molars accounted for 42% of all extractions due to caries which is the highest when compared to other teeth[6].

At the population level, oral health outcomes are related to distal socio-environmental factors and characteristics of the oral health services available. In addition to the use of oral health services, proximal modifiable risk behaviors such as oral hygiene practices, dietary habits, tobacco use and excessive consumption of alcohol are considered.

Over the past decades a large number of research reports have shown that dental caries is linked to social and behavioral factors [3-5]. Most studies on socio-behavioral risk factors in dental caries have been carried out in industrialized countries. Such reports from low- and middle income countries have been published in recent years, probably in response to the growing prevalence rates and severity of dental caries experience in these countries [7-9]. Tooth loss has been associated with several socio-demographic, behavioral, or medical factors [10-17]. Once a sufficient number of teeth are missing, food choices and nutritional changes could contribute to medical problems that might affect an individual's general well-being [18-19].

Current study was undertaken to determine the prevalence of missing first molars in rural suburban and urban population taking into consideration factors such as age, gender, occupation, dietary habits and brushing techniques of the subjects.

The patients reporting to OPD clinic of one of the dental colleges of southern India, & subjects comprised of rural, suburban and urban population.

The Aim of the study is to evaluate the prevalence of loss of first molar due to dental carries in south Indian rural, suburban and urban population.

MATERIALS AND METHOD

The present study is a cross sectional study comprising 1000 selected subjects reporting to OPD of the selected dental college with first molar missing due to caries. Each subject was observed for missing first molars. 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. Two examiners accomplished the assessment, and data was described in a proper form.

RESULT
Table 1: Socio -demographic details

Total sample size (N): 1000

Variables	Frequency (f)	Percent (%)
Gender		
Male	598	59.8
female	402	40.2
Age Group		
15 -29 years	473	47.3
30 – 44 years	352	35.2
45 – 65 years	175	17.5
Occupation		
professional	38	3.8
unprofessional	92	9.2
skilled	104	10.4
unskilled	117	11.7
clerical	68	6.8
student	305	30.5
house wife	213	21.3
others	63	6.3
Place		
urban	727	72.7
suburban	206	20.6
rural	67	6.7

Information collected related to socio demographic details were gender, age, occupation and place. The result shows (table 1), majority of the sample population were males (59.8%); age of the patients were categorized into three categories as 15 – 29 years, 30 – 44 years & 45 to 65 years. 47.3% were from the age group of 15 to 29; occupation was also categorized into eight groups as professional, unprofessional, skilled, unskilled, clerical, student, house wife & others. 305 (30.5%) were students followed by 213 (21.3%) who were house wives; place was categorized as urban, suburban & rural. maximum number of patients were from urban area (72.7%).

Oral hygiène habits
Table 2: Oral hygiene habits

Variables	Frequency	Percent
Diet		
vegetarians	328	32.8
Non vegetarians	672	67.2
Brushing type		
paste and brush	961	96.1
other methods	39	3.9
Frequency of brushing		
Once daily	768	76.8
Twice daily	232	23.2
Brushing method		
Horizontal strokes	774	77.4
Vertical strokes	156	15.6
Circular strokes	70	7.0

Personal habit information collected was: Diet, brushing type, frequency of brushing and brushing method. Majority were non-vegetarians (67.2%); 96.1% were using paste and brush for cleaning their teeth; most of them had a habit of brushing once in a day (76.8%); 77.4% said their method of brushing is horizontal.

Missing first molar due to caries

Table 3: prevalence of missing first molar and significance

Variables	First molar - absent		First molar - present		Significance 'p'
	Frequency (f)	Percent (%)	Frequency (f)	Percent (%)	
Gender					
Male	365	61.0%	233	39.0%	.058*
Female	221	55.0%	181	45.0%	
Age – group					
15-29 years	336	71.0%	137	29.0%	.001**
30-44 years	188	53.4%	164	46.6%	
45-65 years	61	34.9%	114	65.1%	
Occupation					
professional	19	50.0%	19	50.0%	.040*
Unprofessional	39	42.4%	53	57.6%	
Skilled	56	53.8%	48	46.2%	
Unskilled	73	62.4%	44	37.6%	
Clerical	32	47.1%	36	52.9%	
Student	239	78.4%	66	21.6%	
house wife	104	48.8%	109	51.2%	
Others	30	47.6%	33	52.4%	
Place					
Urban	419	57.6%	308	42.4%	.708
Suburban	137	66.5%	69	33.5%	
Rural	29	43.3%	38	56.7%	
Diet					
vegetarians	191	58.2%	137	41.8%	.946
Non vegetarians	394	58.6%	278	41.4%	
Brushing type					
paste and brush	561	58.4%	400	41.6%	.743
other methods	24	61.5%	15	38.5%	
Frequency of brushing					
Once daily	423	55.1%	345	44.9%	.001**
Twice daily	70	30.2%	162	69.8%	
Brushing method					
Horizontal	450	58.1%	324	41.9%	.302
Vertical	87	55.8%	69	44.2%	
Round	48	68.6%	22	31.4%	

*significant, **highly significant*

Cross tabulation was done in SPSS software version 16.0 and also the tests of significance. The results showed (refer table 3) that in 61% of the males' first molar was missing compared to 55% of the females with mission first molar. The test showed significance (p=.058). In age group analysis the results showed prevalence of tooth loss we very high in the age group of 15 to 29 years (71%). The groups with range from 30 to 44 years, 45 to 65 years, revealed significantly lesser number of tooth loss (p=<.001). The prevalence of absence of first molar was seen high in students (78.4%), followed by unskilled category (62.4%). In other categories the prevalence of absence was less compared to the two mentioned categories. (p=.040).

Table 3 also shows that the prevalence of missing first molar is high in suburban population(66.5%) compared to urban (57.6%) and rural population (43.3%). Table 2, shows a similar prevalence of tooth loss between non-vegetarians (58.2%) and vegetarians (58.6%). There was not much difference in the prevalence of tooth loss between the brushing types. i.e., 58.4% in people who used paste and brush and 61.1% in people who used other methods.

Prevalence of missing first molar was seen less (30.2%) in category of people who had the habit of brushing twice. The correlation test showed the finding as highly significant (p=<.001). Brushing method did not show any significance with 68.6% prevalence of missing first molar was seen in people who practiced circular brushing method.

DISCUSSION

The anterior teeth loss increased significantly with aging, while the tooth mortality of premolar and molar were higher in younger people. Dental caries was the more prevalent reason for tooth mortality among young subjects and adults up to 44 years old, while periodontal disease was the main reason for extractions from 45 years old until range of 81 years in Brazilian population [20]. The current study is at par with the Brazilian study and it was found out that 71% of the subjects were between 15 and 29 years of age. Only 34.9% was reported from the age group of 45 to 65 years of age. The finding was very significant with p=<.001.

As per the current study, results showed that the number of males with missing first molar is more than females. In

contrast, the Brazilian study by Barbato et al [21] verified higher prevalence of tooth mortality in women than in men. One Indian study by Kalyanpur and K V Prasad, assessed the tooth mortality among the urban and rural adult population of Dharwad district (India) in 1223subjects (685 urban and 538 rural) and found that females compared to males had higher tooth loss[22]. Moreover, our findings showed that the age group between 15 to 29 years showed a maximum prevalence of 71% of missing first molar. The study conducted by Andr´eia et al shows that the groups with range from 35 to 44 years, 45 to 54 years, and 55 to 64 years revealed significantly greater number of teeth extractions than other age groups. [23] The same study shows higher missing teeth for premolars and molars among the youngest subjects (15 to 24 years), and dental caries was the main reason for teeth extractions. Barbato and Peres found more than 55% of missing first molars, and dental caries experience were found in 92.71% of all teeth lost [19]. Other studies also suggested that the first molars were the most frequently missing teeth in subjects aged from 14 to 29 [24]. In our study, effort was made to find out the prevalence of missing first molar occupation wise. Maximum prevalence was seen in student category. 78.4% of the students lost their first molar due to caries. Probably this difference could also be related to the study area, setting, and frequency of students visiting the clinic. There is little evidence that vegetarians have better dental health than do non-vegetarians. It is often thought that because vegetarians eat diets that are high in natural foods (fruits and vegetables high in dietary fiber) and low in refined sugar, their diets act as natural toothbrushes, reducing caries risks [25]. Our current study also shows there is no or very little difference (58%) in the prevalence of missing first molar due to caries. It is not surprising that the data regarding the association between caries and tooth-brushing among adults are equivocal, with some studies supporting this relationship and others not demonstrating a significant relationship between caries and tooth-brushing [26].

Overall, the evidence is so limited that no conclusions can be drawn from the existing literature, although the literature does provide some weak evidence of an inverse association between oral hygiene and root caries. In contrast, current study shows, in subjects who brush their teeth twice, the prevalence of missing first molar was less (30.2%) compared to those who brushed once (55.1%). There is little doubt about how people can contribute to good oral health and hygiene through their own behavior [27]. Still this elementary habit is not as widely and fully practiced as dentists and health organizations would like it to be in order to achieve a basic health status.

CONCLUSIONS

Within the limits of this study, it can be suggested that some the reasons for missing first molar due to caries were dependent on – gender, age, occupation and frequency of brushing in the selected Indian population. It is essential to oral health that the whole of the factors is considered in the assessment of risks to oral health. An appropriate range of policies, preventive strategies and approaches to caries prevention can be generated if risks are assessed.

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