

ORIGINAL ARTICLE

Prevalence of Missing First Molar in South Canara District Population

Anuj Varshney, Mithra N Hegde, Mahalaxmi Yelapure

ABSTRACT

Aim: This study was to evaluate the prevalence of missing the first molar in South Canara district population.

Materials and Methods: The study was conducted on 1000 patients attending the Department of Conservative Dentistry and Endodontics, A. B. Shetty Memorial Institute of Dental Sciences, Mangalore and rural satellite centers. Each patient was examined for missing the first molars on a dental chair under a good illumination using sterilized armamentarium. The patients who have missing the first molars were questioned with a standard questionnaire.

Results: The prevalence of loss of the first molars in South Canara district population is 42%. Of four first molars, mandibular right first molar loss (34.7%) is more prevalent and maxillary left first molar loss (4.6%) is least prevalent.

Conclusion: The prevalence of missing the first molars in relation to etiology shows dental caries is the most common etiology of loss of the first molars (59.5%), followed by periodontitis (35.7%). The prevalence of missing the first molars in relation to occlusion of 420 patients, 140 cases had shown tilting of adjacent tooth, 80 cases had shown supraeruption. Dental caries is the common etiological factor for loss of the first molar.

Keywords: Caries, Missing, Molars, Prevalence.

How to cite this article: Varshney A, Hegde MN, Yelapure M. Prevalence of Missing First Molar in South Canara District Population. *Int J Med Oral Res* 2018;3(1):26-30.

Source of support: Nil

Conflicts of interest: None

INTRODUCTION

In the permanent dentition, the first permanent molar is the first tooth to erupt when a child is 6 years of age.^[1] The first permanent molar is more effective in chewing food than any other teeth. This is because of its wide occlusal surface and is considered as the most

important oral masticatory unit playing a fundamental role in favorable occlusion.^[2] Since it is distally located in the oral cavity, it is difficult to maintain good oral hygiene of all the surfaces of the tooth as the brush does not reach the distal surfaces. Entrapment of food in deep pits and fissures results in improper removal during brushing which, in turn, leads to caries; therefore, it is the most caries-prone tooth in the permanent dentition.^[3,4] Mandibular molars precede the maxillary molars in eruption. The first permanent molar erupts posterior to the second deciduous molar, taking up contact with it. Therefore, the first permanent molars are not succedaneous teeth because it has no predecessor. As a consequence of their positions and the eruption, they are considered as the "cornerstones" of the dental arches.^[5] This tooth is a fundamental factor in eruption of other permanent teeth in a favorable position and suitable occlusion. It also plays a major role in coordinating horizontal, anterior-posterior, and transversal growth of both jaws, facial growth, and facial height.^[6-8] It is reported that loss of permanent molars produces adverse effects on occlusion, thereby producing negative effects on both the arches such as tilting of neighboring teeth to hollow spaces, supraeruption of the teeth in the opposite arch, unilateral chewing, shift in midline, and dental malocclusion.^[9] 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.^[10-14] Understanding the etiology of tooth loss in a population is important in conducting dental health programs for preventive measures.

Thus, the aim of this study was to determine the prevalence of the missing first molar teeth and occlusion analysis in patients of Dakshina Kannada population and to determine the factors which showcase the loss permanent first molar.

MATERIALS AND METHODS

This is a cross-sectional analytical epidemiological study was conducted on 1000 patients between the age group of <18 years and >60 years from the OPD of the Department of Conservative Dentistry and Endodontics (A.B.S.M.I.D.S.) Deralakatte, and three NITTE University

¹Postgraduate Student, ²Vice Principal and Head, ³Lecturer

Department of Conservative Dentistry and Endodontics, A B Shetty Memorial Institute of Dental Sciences, Mangalore, Karnataka, India

Corresponding Author: Anuj Varshney, Department of Conservative Dentistry and Endodontics, A B Shetty Memorial Institute of Dental Sciences, Mangalore, Karnataka, India. e-mail: varshneyanuj1@gmail.com

Table 1: Representation of percentage of loss of first molars

Loss of first molar	Number of missing molars	Percentage of loss of missing molars
Maxillary right first molar (16)	100	21.7
Maxillary left first molar (26)	70	15.2
Mandibular left first molar (36)	130	28.2
Mandibular right first molar (46)	160	34.7
Total	460	100

Table 2: Loss of first molar depending on different variables

Variables	Loss of first molar (%)		Chi-square test	
	1	2	Value	P value
Gender				
Male	240 (57.14)	180 (31.03)	68.165	<0.001*
Female	180 (42.85)	400 (68.96)		
Total	420	580		
Location				
Rural	218 (51.9)	272 (46.8)	2.445	0.117*
Urban	202 (48.09)	308 (53.1)		
Total	420	580		
Dietary habits				
Vegetarian	94 (22.3)	121 (20.86)	0.333	0.563*
Mixed	326 (77.6)	459 (79.13)		
Total	420	580		

*Significant

Table 3: Loss of first molar depending on different variables

Variables	Loss of first molar		Chi-square test	
	1	2	Value	P
Brushing frequency				
Once	265 (63.09)	412 (71.03)	7.41	0.024*
Twice	130 (30.9)	145 (25)		
More than twice	25 (5.9)	23 (3.9)		
Total	420	580		
Hand used for brushing				
Right	373 (88.8)	522 (90)	0.3674	0.544*
Left	47 (11.1)	58 (10)		
Total	420	580		

*Significant

rural satellite centers, namely Farangipet, Hejmadikody, and Nitte, in South Canara District, Karnataka, from June 2016 to September 2016.

Inclusion Criteria

Patients aged from <20 years to >66 years. Patients with no chronic systemic diseases were included in the study.

Exclusion Criteria

Exclusion Criteria Completely edentulous patients. Multiple missing of teeth due to syndromes. Physically and mentally diseased individuals. Each patient was examined for missing the first molars under dental chair in a good illumination of light using sterilized mouth

mirror, explorer, and tweezers. The patients who had missing the first molar teeth were questioned with a standard questionnaire based on oral health survey the WHO format 2013. A detailed history was recorded and questions were asked to assess the relation associated with age, gender, location, occupation, diet, reason, and brushing frequency, and the change in occlusion with respected to supraeruption and tilting of teeth associated with loss of permanent first molar was noted. Patients were asked to sign consent form before the case history recording. The results were subjected to statistical analysis using Statistical Package for the Social Sciences (SPSSv16.0).

RESULTS

- The prevalence of loss of the first molars in South Canara district population is 42%. Of four first molars, mandibular right first molar loss (34.7%) is more prevalent and maxillary left first molar loss (15.2%) is least prevalent [Table 1].
- The prevalence of missing the first molars in relation to the age group shows that of 420 patients of missing the first molars, 51.7% of cases were seen in the age group of 40–60 years. 2.4% of cases are seen in the age group of >60 years [Figure 1].
- The prevalence of missing the first molars in relation to the gender shows that of 420 patients examined, 240 male patients (57.1%) are having missing the first molars and 180 female patients (42.9%) are having missing the first molars [Table 2].
- The prevalence of missing the first molars in relation to the geographic location shows that of 420 patients of missing the first molars, 202 (48.09%) cases are seen in urban area and 218 (51.9%) cases are seen in rural areas [Table 2].
- The prevalence of missing the first molars in relation to diet shows that of 420 patients of missing the first molars, 326 cases (77.6%) are seen in patients having non-vegetarian food and 94 cases (22.3%) are seen in patients having vegetarian food [Table 2].
- The prevalence of missing the first molars in relation to occupation shows that of 420 patients of missing the first molars, 178 cases (42.38%) are seen in laborers, 25 cases (5.9%) are seen in business people, 29 cases (6.9%) are seen in service people

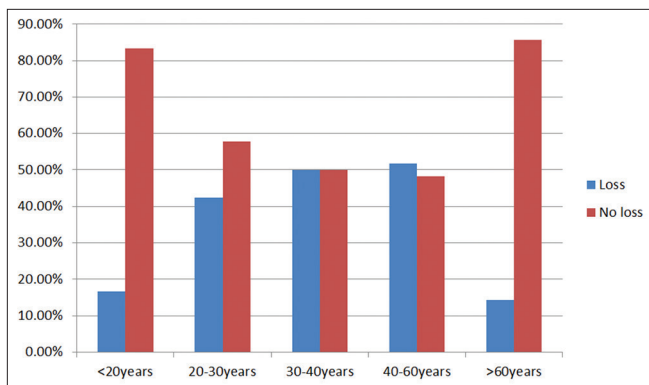


Figure 1: Bar diagram representing loss of first molar in different age groups. Different type of age groups significantly affected loss of first molar Chi-square=71.784, $P < 0.001^*$

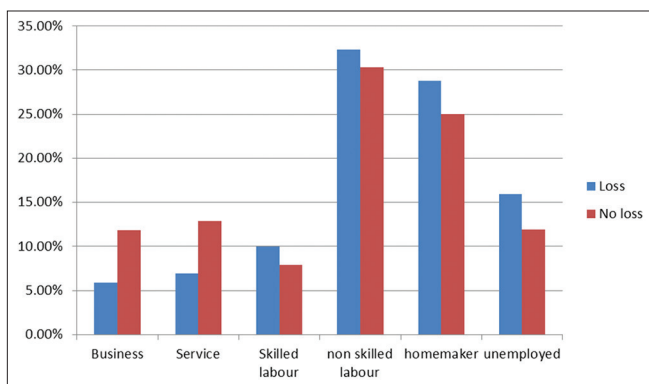


Figure 2: Bar diagram representing loss of first molar with respect to occupation different type of occupations significantly affected loss of first molar Chi-square=23.45, $P < 0.001^*$

and 121 cases (28.8%) are seen in homemaker, and 67 (15.9%) are seen in unemployed people [Figure 2].

- The prevalence of missing the first molars in relation to brushing frequency shows that of 420 patients, 265 patients (63.09%) brush once in a day and are having loss of the first molar, 130 patients (30.9%) brush twice a day and are having loss of the first molar, 25 patients (5.9%) brush more than twice a day and are having loss of the first molars [Table 3].
- The prevalence of missing the first molars in relation to hand use for brushing shows that of 420 patients of missing the first molars, 373 cases (88.8%) are seen in patients using the right hand for brushing and 47 cases (11.1%) are seen in patients using the left hand for brushing [Table 3].
- The prevalence of missing the first molars in relation to etiology shows that dental caries is the most common etiology of loss of the first molars (59.5%), followed by periodontitis (35.7%) [Table 4].
- The prevalence of missing the first molars in relation to occlusion shows that of 420 patients, 140 cases had shown tilting of adjacent tooth and 80 cases had shown supraeruption [Table 4]

Table 4: Loss of first molar depending on different variables

Variables	Among subjects with loss of first molar	
	Frequency (%)	
Loss of first molar		
Yes	420 (42)	
No	580 (58)	
Reason		
Caries	250 (59.5)	
Periodontitis	150 (35.7)	
Others	20 (4.7)	
Quadrant		
1.0	100 (21.7)	
2.0	70 (15.2)	
3.0	130 (28.2)	
4.0	160 (34.7)	
Side		
Right	260 (56.5)	
Left	200 (43.4)	
Time elapsed		
<6 months	150 (35.7)	
6 months–1 year	160 (38.09)	
>1 year	110 (26.1)	
Analysis of occlusion		
Supraeruption	80 (19.04)	
Tilting	140 (33.33)	
No change	200 (47.61)	

- The prevalence of missing the first molars in relation to time elapsed of 420 patients, 150 cases (35.7%) lost their first molars in less than six months. 160 cases (38.09%) lost their first molars within 6 months to 1 year time, 110 cases (26.1%) lost their first molars after 1 year [Table 4].

DISCUSSION

The prevalence of missing molars in South Canara district population is 42%. Of 1000 patients examined, 420 patients have missing the first molars. In the present study, there is an increase in loss of the first molars from 41.55% in 2012 to 42% in 2016.^[3] The mandibular permanent first molar loss is most commonly seen than maxillary first molar loss. This could be due to the presence and position of parotid duct (Stensen duct) which is opposite to the maxillary first molar imparting self-cleansing effect of saliva on maxillary molars.

In the present study, maximum numbers of cases are seen in the age groups of 40–60 years (51.7%). This could be due to increase in progression of caries and increased risk of periodontal pathologies as the age advances. Vignarajah^[15] in his study on various reasons for loss of permanent tooth found that greater prevalence of loss of tooth was seen in age 40 years and above.

The present study shows that the main etiology of loss of the first molars is due to dental caries. Out of 420 patients of missing first molars most number of patients

i.e 250 patients (59.5%) have shown loss of first molars due to dental caries followed by 150 patients due to periodontitis (35.7%). Upadhyaya and Humagain^[16] stated that dental caries was the major cause for losing teeth in younger group of people and periodontitis was the major cause for tooth loss among the older age group. Agerholm and Sidi^[17] in their study have found that caries and its sequelae are responsible for more than half of the extractions while periodontitis was the second common cause.

The prevalence of loss of the first molars is most commonly seen in male patients (57.1%) than the females (42.9%). This could be due to adverse habits such as smoking, alcohol, and tobacco chewing in males. Locker et al.[18] in their study on incidence and risk factors for tooth loss found that males had more percentage of losing one or more teeth than females.

The prevalence of loss of the first molars is most commonly seen in urban areas (48.09%) than the rural areas (51.9%). This might be due to change in lifestyle of people living in urban areas cheap and easy availability of carbonated drinks and junk foods. Preethanath^[19] in their study concluded that as far as the type of tooth extracted, the most commonly extracted were mandibular posterior teeth in rural areas (40.57%) and maxillary posterior teeth in urban areas (56.0%).

Based on diet, loss of the first molars is seen in patients having mixed diet (77.6%) than patients having vegetarian diet (22.3%). Dwyer^[20] stated that 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.

In this study, effort was made to find out the prevalence of missing the first molars occupation wise. Non-skilled laborers have shown higher prevalence of missing the first molars; it can be because of low socio-economic status, lower oral health awareness.

Based on occlusal analysis, tilting of adjacent tooth is more commonly seen followed by supraeruption. Artun and Thalib^[21] also stated that the prevalence of loss of the first molar and mesial migration was more common in mandible 70%.

CONCLUSION

The prevalence of missing molars in South Canara district population is 42%. Mandibular right first molar loss (34.7%) is more prevalent. Dental caries is the common etiological factor for loss of the first molar. Dental health campaigns should be conducted regularly, to educate people about the problems of dental caries and the priority for immediate treatment of dental caries should be

more emphasized. It can also be suggested that some of the reasons for missing the first molars were dependent on - hand used for brushing and dietary habits; therefore, it is essential to oral health that the whole of the factors is considered in the assessment of risk to oral health.

Hence, the need for oral health education and awareness is very crucial among the Indian population to prevent this further loss of teeth.

REFERENCES

1. Ash MM, Nelson SJ. Wheeler's Dental Anatomy, Physiology and Occlusion. 8th ed. St. Louis, Mo: Elsevier; 2007. p. 263-4.
2. Moghadas H, Mozeh MB. Periodontium in Health and Disease. 3rd ed. Tehran: Nashr Jahad Co.; 1995. p. 502.
3. Hegde MN, Ragavendran V. Prevalence of missing first molar on south Indian population-a retrospective study. Int J Res Dev 2012;1:25-9.
4. Skeie MS, Raadal M, Strand GV, Espelid I. The relationship between caries in the primary dentition at 5 years of age and permanent dentition at 10 years of age - a longitudinal study. Int J Paediatr Dent 2006;16:152-60.
5. Muthu MS, Sivakumar V. Pediatric Dentistry Principles and Practice. 1st ed. St. Louis, Missouri: Mosby Elsevier; 2009. p. 99-100.
6. Barnett EM. Pediatric Occlusal Therapy. 2nd ed. St. Louis: Mosby; 1974. p. 240-9.
7. Nanda SK. The Developmental Basis of Occlusion and Malocclusion. Chicago: Quintessence; 1983. p. 168.
8. Major MA. Wheeler's Dental Anatomy, Physiology and Occlusion. 7th ed. Philadelphia, PA: WB Saunders Co.; 1993. p. 79-117, 325-430.
9. Ebrahimi M, Ajami BA, Sarraf Shirazi AR, Afzal Aghae M, Rashidi S. Dental treatment needs of permanent first molars in Mashhad schoolchildren. J Dent Res Dent Clin Dent Prospects 2010;4:52-5.
10. Moen BD. Bureau of economic research and statistics: Survey of needs for dental care. II. dental needs according to age and sex of patients. J Am Dent Assoc 1953;46:200-11.
11. Coxhead LJ. Reasons for extractions in general practice. N Zeal Dent J 1960;56:182-3.
12. Lundqvist C. Tooth mortality in Sweden. A statistical survey of tooth loss in the Swedish population. Acta Odontol Scand 1967;25:298-322.
13. Machado FA, Godoy HA, Terra AJ, Marzola C. Principais causas das exodontias no município de campo grande, MT. Arq Cent Estud Fac Odontol UFMG 1973;10:129-51.
14. Macgregor ID. The pattern of tooth loss in a selected population of Nigerians. Arch Oral Biol 1972;17:1573-82.
15. Vignarajah S. Various reasons for permanent tooth extractions in a Caribbean population - antigua. Int Dent J 1993;43:207-12.
16. Upadhyaya C, Humagain M. The pattern of tooth loss due to dental caries and periodontal disease among patients attending dental department (OPD), Dhulikhel hospital, Kathmandu university teaching hospital (KUTH), Nepal. Kathmandu Univ Med J (KUMJ) 2009;7:59-62.

17. Agerholm DM, Sidi AD. Reasons given for extraction of permanent teeth by general dental practitioners in England and wales. *Br Dent J* 1988;164:345-8.
18. Locker D, Ford J, Leake JL. Incidence of and risk factors for tooth loss in a population of older canadians. *J Dent Res* 1996;75:783-9.
19. Preethanath RS. Reasons for tooth extraction in urban and rural population of Saudi Arabia. *Pak Oral Dent J* 2010;30:199-204.
20. Dwyer JT. Health aspects of vegetarian diets. *Am J Clin Nutr* 1988;48:712-38.
21. Artun J, Thalib L. Mesial migration and loss of first molars among young adolescents in Kuwait. *Community Dent Health* 2011;28:154-9.