



PREVALENCE OF MISSING FIRST MOLARS IN SOUTH INDIAN POPULATION

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ABSTRACT

Aim: The aim and objectives of the study was to evaluate the prevalence of missing first molars in South Indian population.

Materials And Methods: The study was conducted on 2000 patients attending the Department of Conservative Dentistry and Endodontics, A. B.Shetty Memorial Institute of Dental Sciences, Mangalore and Rural Satellite centres of NITTE University. Each patient was examined for missing first molars under dental chair in a good

illumination using sterilized armamentarium. The patients who have Missing first Molars were questioned with a standard questionnaire. **Results:** Prevalence of missing first molars in south Indian population is 44%. It is most commonly seen in Mandibular molars (29.8%) than maxillary molars (18%). The Mandibular right first molar (33.35%) is most commonly missing tooth and Maxillary left first molar tooth is least prevalent. The prevalence of missing molars is commonly seen in males (55.7%) than females (44.3%). The most common etiological factor for loss of first molar tooth is dental caries (72.7%). It is most commonly seen in manual workers (40.7%) and people with business as occupation (23.1%). Missing first molars is most commonly seen in age groups of 36-45 years (32%). The most commonly found occlusal problem is tilting of adjacent teeth. **Conclusion:** Loss of first molars is most commonly seen in males with increased prevalence in 36-45 years of age. It is most commonly seen in Mandibular right first molar tooth and least commonly seen in Maxillary left first molar tooth. The common etiological factor for loss is dental caries.

KEYWORDS: Missing, Molars, Caries.

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 ^[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. As a consequence of the significance of their positions and the circumstances surrounding their eruption, First molars are considered as the "CORNER STONES"^[2] of the dental arches. They have an important role in the development and maintenance of the occlusion. Because it is the most distal tooth in the oral cavity it is difficult to maintain good oral hygiene of all the surfaces of the tooth as the brush do not reach the distal surfaces of the first molar and entrapment of food in deep pits and fissures results in improper removal during brushing which in turn leads to caries ^[3]. Hence, the first permanent molar (FPM) is the most caries-prone tooth in the permanent dentition ^[4]. This tooth is an important factor in guiding the eruption of other permanent teeth into suitable position, development of occlusion and synchronizing horizontal, anterior-posterior and transversal growth of both jaws, facial growth, and facial height ^[9].

Understanding the aetiology of tooth loss in a population is important in conducting dental health programs for preventive measures. The common Questionnaire 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. Dental caries and periodontal disease were the main reasons for tooth extraction ^[5]. A number of factors should be considered during the treatment planning for carious first molars. They include the amount of tooth structure left, maturity of pulp and vitality of tooth.

AIM

The aim and objectives of the study was to evaluate the prevalence of missing permanent first molars in south Indian population.

MATERIALS AND METHODS

This study was conducted to collect information on the prevalence of loss of first molar in South India by examining the Dakshina Kannada population. The Dakshina Kannada district is in Karnataka state, India of 4866 km² area, population density around 457 inhabitants per square km with a total population of 20, 89,649 in this district. The rural and urban population is 14, 43,207 & 6, 46,442 respectively with a male female ratio around 1000:1018.

After obtaining the institutional ethical clearance, study was conducted in June-July 2014 on randomly selected 2000 subjects from the dental outpatient Department of Conservative Dentistry and Endodontics and the 5 rural satellite centres namely, Farangipet, Hejimidikody, Mundkoor, Thalipady and Nitte. The patients are sub grouped into six groups depending on age 1)15-25 Years 2)26-35 Years 3)35-45 Years 4)46-55Years 5)56-65 Years 6) >65 Years.

Out of 2000 patients 843 patients are from rural satellite centres and 1,157 patients are from OPD of Department of Conservative Dentistry and Endodontics. Each patient was examined for missing first molars under dental chair in a good illumination of light using sterilized mouth mirror, explorer, and tweezers. The Patients who had missing first molar teeth were questioned with a standard questionnaire based on WHO oral health survey 2013 was used to assess the relation associated with age, gender, location, occupation, diet, reason and brushing method. A detailed case history was recorded and signed consent form obtained. The study was performed by well trained dentists and the data is recorded on prepared survey form. The results were subjected to statistical analysis using Statistical package for the social sciences (SPSSv16.0).Difference between variables were analyzed using Pearson's chi-square test.

The inclusion criteria were:

- patients aged from 15yrs to >66 years
- Patients with no chronic systemic diseases.

The cases with complete edentulous mouth, multiple missing of teeth due to syndromes, physically and mentally diseased individuals, patients younger than the age 15 are excluded from the study.

RESULTS

The prevalence of loss of first molars in south Indian population is 44% (TABLE-1).The Mandibular first molar loss (29.8%) is more prevalent than maxillary first molar loss (18%). Out of four first molars, Mandibular right first molar loss (33.35%) is more prevalent and maxillary left first molar loss (16.66%) is least prevalent (TABLE-2).Unilateral loss (41%) is more common than bilateral molar tooth loss (3%).

The prevalence of missing first molars in relation to the age group shows that Out of 880 patients of missing first molars 32% cases were seen in age groups of 36-45 years.26.6%

cases are seen in age group of 26-35 years. The prevalence of missing molars increases as the age increase. (TABLE-3)

The prevalence of missing first molars in relation to the gender shows that Out of 2000 patients examined 1100 patients are males and 900 patients are females. 490 male patients (55.7%) are having missing first molars.390 female patients (44.3%) are having first molars missing. (TABLE-4)

The prevalence of missing first molars in relation to the Geographic location shows that Out of 880 patients of missing first molars, 419 (47.6%) cases are seen in urban area ,370 (42%) cases are seen in rural areas and only 10.3% of cases are seen in semi urban location. (TABLE-5)

The prevalence of missing first molars in relation to diet shows Out of 880 patients of missing first molars, 560 cases (63.6%) are seen in mixed diet patients, 255 cases (29%) are seen in vegetarian diet patients and 65 (7.4%) cases are seen in pescatarians. (TABLE-6)

The prevalence of missing first molars in relation to occupation shows that Out of 880 patients of missing first molars, 358 cases (40.7%) are seen in workers, 203 cases (23.1%) are seen in business people and 177 cases (20.1%) are seen in house wives. (TABLE-7)

The prevalence of missing first molars in relation to brushing type shows that Out of 880 patients, 864 patients(98.2%) using tooth brush and dentifrice have missing first molars. The results are not statically significant (TABLE-8).Horizontal brushing method (48.6%) had shown more of missing molars than vertical brushing method (45%) which is statically significant(TABLE-9). Patients with brushing frequency of once daily (68.2%) showed the highest loss of first molars than the patients who brushes daily twice (29.5%). (TABLE-10)

The prevalence of missing first molars in relation to etiology shows Dental caries is the most common etiology of loss of first molars (72.7%), followed by periodontitis (22.7%). (TABLE-11)

The prevalence of missing first molars in relation to occlusion Out of 880 patients, 280 cases had shown tilting of adjacent tooth, 160 cases had shown supra eruption and 80 cases had shown premature contact. (TABLE-12)

The prevalence of missing first molars in relation to time elapsed Out of 880 patients, 320 cases (36.4%) lost their first molars 7months-1year back, 300 cases lost their first molars0-6months back. (TABLE-13)

TABLE 1-Prevalence of loss of first molar teeth

LOSS OF FIRST MOLAR	NO. OF CASES	PERCENTAGE OF LOSS OF FIRST MOLARS
UNILATERAL	820	41%
BILATERAL	60	3%
TOTAL	880	44%

TABLE 2-Percentage of loss of missing first molar

MISSING FIRST MOLARS	NO. OF MISSING MOLARS	PERCENTAGE OF LOSS OF MISSING MOLARS
MAXILLARY RIGHT FIRST MOLAR(16)	200	20.83%
MAXILLARY LEFT FIRST MOLAR(26)	160	16.66%
MANDIBULAR LEFT FIRST MOLAR(36)	280	29.16%
MANDIBULAR RIGHT FIRST MOLAR(46)	320	33.35%
TOTAL	960	100%

TABLE 3-Prevalence of missing first molars with respect to age [Chi square=3.806, P=0.578]

AGE			PERCENTAGE OF LOSS OF MISSING MOLARS
15-25	NO.OF CASES	126	
	MISSING FIRST MOLARS	52	5.9%
26-35	NO. OF CASES	514	
	MISSING FIRST MOLARS	234	26.6%
36-45	NO.OF CASES	640	
	MISSING FIRST MOLARS	282	32%

46-55	NO. OF CASES	412	
	MISSING FIRST MOLARS	186	21.1%
56-65	NO. OF CASES	254	
	MISSING FIRST MOLARS	108	12.3%
>66	NO. OF CASES	54	
	MISSING FIRST MOLARS	18	2%
TOTAL	MISSING FIRST MOLARS	880	100%

TABLE 4-Prevalence of loss of first molars with respect to gender [Chi square=0.295, P=0.578]

GENDER			PERCENTAGE OF LOSS OF FIRST MOLARS
MALES	NO.OF CASES	1100	
	LOSSOF FIRST MOLARS	490	55.7%
FEMALES	NO. OF CASES	900	
	LOSS OF FIRST MOLARS	390	44.3%
TOTAL	NO. OF CASES	2000	
	LOSS OF FIRST MOLARS	880	100%

TABLE-5 Prevalence of missing first molars with respect to location [Chi square=0.205, P=0.903]

LOCATION			PERCENTAGE OF MISSING FIRST MOLARS
URBAN	NO.OF CASES	957	
	MISSING FIRST OLARS	419	47.6%
SEMI URBAN	NO. OF CASES	200	
	MISSING FIRST OLARS	91	10.3%
RURAL	NO. OF CASES	843	
	MISSING FIRST OLARS	370	42.0%
TOTAL	NO. OF CASES	2000	
	MISSING FIRST MOLARS	880	100%

TABLE 6- Prevalence of missing first molars with relation to diet [Chi square=3.599, p=0.165]

DIET			PERCENTAGE OF LOSS OF FIRST MOLARS
VEGETARIANS	NO. OF CASES	611	
	LOSS OF IRST MOLARS	255	29%
MIXED DIET	NO. OF CASES	1227	
	LOSS OF FIRST MOLARS	560	63.6%
PESCATARIANS	NO. OF CASES	162	
	LOSS OF FIRST MOLARS	65	7.4%
TOTAL	NO. OF CASES	2000	
	LOSS OF FIRST MOLARS	880	100%

TABLE 7- Prevalence of missing first molars with respect to occupation [Chi square=1.395,P=0.845]

OCCUPATION			PERCENTAGE OF LOSS OF FIRST MOLARS
LABOROUR	NO.OF CASES	221	
	LOSSOF FIRST MOLARS	94	10.7%
HOUSE WIFE	NO. OF CASES	407	
	LOSS OF FIRST MOLAR TEETH	177	20.1%
STUDENT	NO. OF CASES	117	
	LOSS OF FIRST MOLARS	48	5.5%
WORKER	NO. OF CASES	813	
	LOSS OF FIRST MOLARS	358	40.7%
BUSSINESS	NO. OF CASES	441	
	LOSS OF FIRST MOLARS	203	23.1%
TOTAL	NO. OF CASES	2000	
	LOSS OF FIRST MOLARS	880	100%

TABLE 8- Prevalence of missing first molars with respect to brushing type [Chi square=0.822,P=0.364]

BRUSHING TYPE			PERCENTAGE OF LOSS OF FIRST MOLARS
TOOTH BRUSH AND PASTE	NO. OF CASES	1957	
	LOSS OF FIRST MOLARS	864	98.2%
OTHERS	NO. OF CASES	43	
	LOSS OF FIRST MOLARS	16	1.8%
TOTAL	NO. OF CASES	2000	
	LOSS OF FIRST MOLARS	880	100%

TABLE 9- Prevalence of missing first molars with respect to brushing method [Chi square=31.185,p<0.001]

BRUSHING METHOD			PERCENTAGE OF LOSS OF FIRST MOLARS
HORIZONTAL	NO. OF CASES	1000	
	MISSING FIRST MOLARS	428	48.6%
VERTICLE	NO. OF CASES	800	
	MISSING FIRST MOLARS	396	45%
OTHERS	NO. OF CASES	200	
	MISSING FIRST MOLARS	56	6.4%
TOTAL	NO. OF CASES	2000	
	MISSING FIRST MOLARS	880	100%

TABLE 10- Prevalence of loss missing first molars with relation to brushing frequency [Chi square=18.793,p<0.001]

BRUSHING FREQUENCY			PERCENTAGE OF LOSS OF FIRST MOLARS
ONCE	NO. OF CASES	1280	
	MISSING FIRST MOLARS	600	68.2%
TWICE	NO. OF CASES	640	
	MISSING FIRST MOLARS	260	29.5%
THRICE	NO. OF CASES	80	
	MISSING FIRST MOLARS	20	2.3%
TOTAL	NO. OF CASES	2000	
	MISSING FIRST MOLARS	880	100%

TABLE 11- Prevalence of loss of first molars with relation to etiology

REASON		PERCENTAGE OF LOSS OF FIRST MOLARS
CARIES	640	72.7%
PERIODONTITIS	200	22.7%
OTHERS	40	4.5%
TOTAL	880	100%

TABLE 12- Prevalence of loss of first molar with respect to occlusion

OCCLUSION	NO. OF CASES SEEN WITH OCCLUSAL ABNORMALITIES
SUPRA ERUPTION	160
TILTING OF ADJACENT TOOTH	280
PREMATURE CONTACT	80

TABLE 13- Prevalence of loss of first molar with respect to time elapsed

TIME ELAPSED	NO. OF CASES WITH FIRST MOLARS	PERCENTAGE OF CASES WITH MISSING FIRST MOLARS
0-6 MONTHS	300	34.1%
7MONTHS - 1 YEAR	320	36.4%
1-5 YEARS	200	22.7%
>5YEARS	60	6.8%
TOTAL	880	100%

DISCUSSION

The prevalence of missing molars in south Indian population is 44%. Out of 2000 patients examined 880 patients has missing first molars. In the present study there is an increase in loss of first molars from 41.55% in 2012 to 44% in 2014^[3]. The Mandibular permanent first molar loss is most commonly seen than Maxillary first molar loss. This could be due to the self cleansing effect of saliva on maxillary molars because of opening of Parotid duct (Stensen duct) opposite the maxillary first molars.

In the present study maximum numbers of cases are seen in age group of 36-45years (32%) and the prevalence of missing first molars increases as the age increases. This could be due to increase in caries progression and increased risk of periodontitis as the age advances. According to Mithra N. Hegde^[3] the loss of first molar is seen significantly from the 36-45

(3rd, 4th decade) [47.39%] years and increases as the age advances which are similar to present study. The present study shows that the main etiology of loss of first molars is due to dental caries. Among 880 cases of missing first molars 640 cases (72.7%) has shown loss of first molars due to dental caries and 200 patients due to periodontitis. Hence the study conducted on Dakshina Kannada population revealed dental caries as most common disease for loss of first molars. Upadyaya et al ^[5] confirms that the dental caries is the most common cause of extraction of molars in younger age group.

Among gender, Out of 1100males and 900 females, 490 males (55.7%) and 390 females (44.3%) have missing molars respectively. An association between gender and prevalence of loss of permanent first molars could not be statistically established ($P = 0.587$). 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. Locker D, J. Ford and J. L. Leake^[6] found that males had more percentage of losing one or more teeth than females. Contradictarily, Shigli.K, Hebbal.M, Gangadhar, Angadi.GS^[7] conducted a study concluded that the loss of first molars is more prevalent in females (26.5%) as a result of dental caries than males (15%).

The prevalence of loss of first molars is most commonly seen in urban areas (47.6%) than the rural areas (42%). The common reason might be due to change in life style in urban areas, cheap and easy availability of carbonated drinks and junk foods. Reghunathan S Preethanath^[8] 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 mixed diet (63.6%) had shown highest prevalence of loss of molars than vegetarian diet (29%), pescatarians (fish eaters) (7.4%) had shown the lesser prevalence, the probable cause might be increased fluoride content in fish which in turn have a preventive effect on dental caries and hence, reduced loss of first molars. Based on occupation workers has shown higher prevalence of loss of first molars. It's because of busy schedules and ignoring the dental health. Students have shown less loss of first molars because of increased awareness of dental health in community dental health campaign.

Oral hygiene maintenance with tooth brush and tooth paste showed higher prevalence of loss of first molar over other technique of oral hygiene but was statistically not significant ($P=0.364$) the reason of loss might be due to the usage of wrong brushing method and frequency. The horizontal brushing method showed higher prevalence of missing first molars (48.6%). Vertical method of tooth brushing showed better oral hygiene than other methods. Bassir.L et al ^[9] concluded in his study that dental decay and gingival disease due to poor oral hygiene was so prevalent that emphasized high treatment needs. The study showed oral hygiene status among the 15-year-olds necessitates implementing preventive as well as restorative measures to improve the oral health status of the young population.

Based on loss of first molars and occlusion tilting of adjacent tooth is more commonly seen followed by supra eruption and premature contact. Artun and Thalib^[10] in 2011 also stated the prevalence of loss of first molar and mesial migration was more common in mandible 70%. S.albadri^[11] in their study concluded that the Caries is the main reason for the extraction of first permanent molars in children. Children who are attending dental hospitals for extraction of first permanent molars tend to be older than the optimal age for achieving space closure. There is a need for guidelines advising primary care dentists when to refer children for the extraction of first permanent molars.

CONCLUSION

The prevalence for the loss of first molar in South Indian population is 44%. The common etiological factor for loss of first molars is Dental caries. The loss of first molar is seen higher in workers and business people and dental caries is the main aetiology for this which constitutes about 72.7%. The Mandibular right first molar loss is most commonly seen. The prevalence of missing first molars is most commonly seen in age group of 36-45 years and prevalence increases with increase in age.

This study noted the following points:

- Loss of first molars is a serious dental problem; Dental caries is the main etiological factor. 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.

- Continued Educational program for dental practitioners should be implemented, which improves the skills of early diagnosis and treatment of dental caries and hence decreases the loss of first molars.

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