

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Prevalence of Missing First Molar in South Canara District Population.

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ABSTRACT

To evaluate the prevalence of missing first molar in South Canara district population. 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 centers 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. The prevalence of loss of first molars in south canara district population is 48.65%. Out of four first molars, Mandibular left first molar loss (63.4%) is more prevalent and maxillary right first molar loss (4.6%) is least prevalent. The prevalence of missing first molars in relation to etiology shows Dental caries is the most common etiology of loss of first molars (56.6%), followed by periodontitis (43.4%). The prevalence of missing first molars in relation to occlusion Out of 976patients, 383 cases had shown tilting of adjacent tooth, 467 cases had shown supra eruption. The prevalence of missing molars in south canara district population is 48.65%. Mandibular left first molar loss (63.6%) is more prevalent. Dental caries is the common etiological factor for loss of first molar.

Keywords: missing, caries, molars, prevalence.

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INTRODUCTION

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 [1] . 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

The role of most important oral masticatory unit in the dental arch is played by first permanent molar. It is most effective in chewing food than any other teeth in the human dentition as it has a wide occlusal surface which plays a pivotal role. It forms the core in favourable occlusion evolution. [1, 2] First permanent tooth to erupt is mandibular first molar at the age of six and plays numerous dominant roles in eruption of other permanent teeth thus development and maintenance of the occlusion.[3,4] . It also helps to maintain facial height, facial growth, anterior-posterior and transverse growth of both jaw. [5]

Loss of first permanent molars, because of dental caries, negatively affects both arches and has adverse effects on occlusion. It is reported that early extraction of these teeth results in tilting of neighboring teeth to hollow spaces, supereruption of the teeth in the opposite arch, unilateral chewing, shift in midline and dental malocclusion. [6]

The first permanent molar has been quoted as being the most caries-prone tooth in the permanent dentition, probably as a result of its early exposure to the oral environment. [7]

Understanding the aetiology 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 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 covering 4000 patients visiting the department of Conservative Dentistry and Endodontics in (A.B.S.M.I.D.S), Deralakatte and NITTE University rural satellite centres in South Canara District ,Karnataka . 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 study was conducted after obtaining institutional ethical clearance ,over the period of six months between July 2015 - December2015 on randomly selected 4000 patients between the age group of 15years to 60 years from the dental outpatient Department of Conservative Dentistry and Endodontics and the 5 rural satellite centres namely, Farangipet, Hejimidikody, Mundkooor, Thalipady and Nitte .

Out of 2000 patients 1000 patients are from rural satellite centres and 1000 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 Assessment form – 1997. A detailed history was recorded and questions were asked to assess the relations relation associated with age, gender, location, occupation, diet, reason and brushing method and the change in occlusion with respected to supra-eruption and tilting of teeth associated with loss of permanent first molar was noted. Patients were asked to sign consent form prior to the case history taking. The study was performed by 2 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 60 years • Patients younger than 15 years of age and older than 60 years of age, handicapped and immunocompromised patients were excluded from the study.

RESULTS

The prevalence of loss of first molars in south canara district population is 48.65%. Out of four first molars, Mandibular left first molar loss (63.4%) is more prevalent and maxillary right first molar loss (4.6%) is least prevalent. [Table-1]

The prevalence of missing first molars in relation to the age group shows that Out of 976 patients of missing first molars 23.3% cases were seen in age groups of 56-65 years.9.1% cases are seen in age group of 15-25 years. The prevalence of loss of first molars increases as the age increase. [Table-2]

The prevalence of missing first molars in relation to the gender shows that out of 976 patients examined, 576 male patients (59.0%) are having missing first molars and 400 female patients (41.0%) are having first molars missing. [Table-3]

The prevalence of missing first molars in relation to the Geographic location shows that Out of 976 patients of missing first molars, 527 (54.0%) cases are seen in urban area ,449 (46.0%) cases are seen in rural areas . [Table-3]

The prevalence of missing first molars in relation to diet shows Out of 976 patients of missing first molars, 789 cases (80.8%) are seen in patients having non-vegetarian food, 187 cases (19.2%) are seen in patients having vegetarian food. [Table-3]

The prevalence of missing first molars in relation to occupation shows that Out of 976 patients of missing first molars, 339 cases (34.7%) are seen in labourers, 306 cases (31.4%) are seen in housewives, 66 cases (6.8%) are seen in students and 50 cases (5.1%) are seen in business people. [Table-4]

The prevalence of missing first molars in relation to brushing frequency shows that Out of 976 patients, 622 patients (64.4%) brush once in a day and are having loss of first molar, 344 patients (35.6%) brush twice a day and are having loss of first molar. Horizontal brushing method (78.3%) had shown more of missing molars than vertical brushing method (21.7%). [Table-5]

The prevalence of missing first molars in relation to etiology shows Dental caries is the most common etiology of loss of first molars (56.6%), followed by periodontitis (43.4%). [Table-6]

The prevalence of missing first molars in relation to occlusion Out of 976patients, 383 cases had shown tilting of adjacent tooth, 467 cases had shown supra eruption. [Table-6]

The prevalence of missing first molars in relation to time elapsed Out of 976 patients, 845cases (86.8%) lost their first molars more than one year back,103 cases lost their first molars1-3 months back. [Table-6]

Table 1-Percentage of loss of missing first molar

LOSS OF FIRST MOLAR	NO.OF MISSING MOLARS	PERCENTAGE OF LOSS OF MISSING MOLARS
MAXILLARY RIGHT FIRST MOLAR (16)	45	4.6%
MAXILLARY LEFT FIRST MOLAR (26)	59	6.04%
MANDIBULAR RIGHT FIRST MOLAR (36)	619	63.4%
MANDIBULAR LEFT FIRST MOLAR (46)	253	25.9%
TOTAL	976	100%

Table 2-Prevalence of missing first molars with respect to age [Chi square=318.35, P= <0.001*]

Age	Loss of first molar		Total
	1.0	2.0	
(15-25)	89(9.1%)	175(17.1%)	264(13.2%)
(26-35)	122(12.5%)	302(29.5%)	424(21.2%)
(36-45)	201(20.6%)	308(30.1%)	509(25.5%)
(46-55)	175(17.9%)	142(13.9%)	317(15.9%)
(56-65)	227(23.3%)	81(7.9%)	308(15.4%)
(>66)	162(16.6%)	16(1.6%)	178(8.9%)
Total	976(100.0%)	1024(100.0%)	2000(100.0%)

*P<0.05 statistically significant,

P>0.05 non significant, NS

Table 3- Prevalence of missing first molars with respect to gender, location, centre, dietary habits

		Loss of first molar		Total	Chi square test	
		1	2		value	p-value
Gender	Male	576(59.0%)	505(49.3%)	1081(54.1%)	18.93	<0.001*
	Female	400(41.0%)	519(50.7%)	919(46.0%)		
Location	Rural	527(54.0%)	711(69.4%)	1238(61.9%)	50.49	<0.001*
	Urban	449(46.0%)	313(30.6%)	762(38.1%)		
Centre	OPD	648(66.4%)	742(72.5%)	1390(69.5%)	8.68	0.003*
	Rural	328(33.6%)	282(27.5%)	610(30.5%)		
Dietary habits	Veg	187(19.2%)	183(17.9%)	370(18.5%)	0.55	0.46(NS)
	Non-veg	789(80.8%)	841(82.1%)	1630(81.5%)		

*P<0.05 statistically significant,

P>0.05 non significant, NS

Table 4- Prevalence of missing first molars with respect to occupation

Occupation	Loss of first molar		Total	Chi square test	
	1.0	2.0		value	p-value
Labourer	339(34.7%)	248(24.2%)	587(29.3%)	95.73	<0.001*
Housewife	306(31.4%)	283(27.6%)	589(29.5%)		
Student	66(6.8%)	174(17.0%)	240(12.0%)		
Business	50(5.1%)	125(12.2%)	175(8.8%)		
Others	215(22.0%)	194(18.9%)	409(20.5%)		
Total	976(100.0%)	1024(100.0%)	2000(100.0%)		

*P<0.05 statistically significant,

P>0.05 non significant, NS

Table 5- Prevalence of missing first molars with respect to oral hygiene practice

		Loss of first molar		Total	Chi square test	
		1	2		value	p-value
Brushing method	Horizontal	764(78.3%)	795(77.6%)	1559(78.0%)	0.12	0.73(NS)
	Vertical	212(21.7%)	229(22.4%)	441(22.1%)		
Brushing frequency	Once	622(64.4%)	721(70.4%)	1343(67.5%)	8.21	0.004*
	Twice	344(35.6%)	303(29.6%)	647(32.5%)		
Hand used for brushing	Right	910(93.2%)	958(93.6%)	1868(93.4%)	0.08	0.78(NS)
	Left	66(6.8%)	66(6.4%)	132(6.6%)		

Table 6- Prevalence of missing first molar with respect to reason, quadrant, side, time elapsed and analysis of occlusion

		Among subjects with loss of first molar	
		Frequency	Percent
Loss of 1 st molar	Yes	973	48.65
	No	1027	51.35
Reason	Caries	551	56.6
	Periodontitis	422	43.4
Quadrant	1.0	42	4.3
	2.0	59	6.1
	3.0	619	63.6
	4.0	253	26.0
Side	Right	657	67.5
	Left	316	32.5
Time elapsed	1-3 months	103	10.6
	4-6 months	20	2.1
	1 year	5	0.5
	>1 year	845	86.8
Analysis of occlusion	Supra-eruption	467	48.0
	Tilting	383	39.4
	No change	123	12.6

DISCUSSION

The prevalence of missing molars in south canara district population is 48.65%. Out of 2000 patients examined 976 patients has missing first molars. In the present study there is an increase from 41.55% in 2012 to 48.65% in 2015.[8] 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 (Stenson 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 age groups of 56-65 years (23.3%). This could be due to increase in progression of caries and increased risk of periodontal pathologies as the age advances. *Vignarajah S* in his study on various reasons for permanent tooth found that greater prevalence of loss of tooth was seen in age 40 years and above. [9] *Upadhaya C and Humagain M* in their study found that highest portion of extraction due to caries occurred between 21-30 years of age while that of periodontal disease was between 51-60 years of age.[10]

The present study shows that the main etiology of loss of first molars is due to dental caries. Out of 976 patients of missing first molars 551 patients (56.6%) has shown loss of first molars due to dental caries followed by periodontitis (43.4%). *Upadhaya C and Humagain M* 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 DM and Sidi AD* 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.[11]

The prevalence of loss of first molars is most commonly seen in male patients (59.0%) than the females (41.0%). *Locker D, J. Ford and J. L. Leake* in their study on incidence of and risk factors for tooth loss found that males had more percentage of losing one or more teeth than females.[12] This could be due to adverse habits like smoking, alcohol, Tobacco chewing in males.

The prevalence of loss of first molars is most commonly seen in urban areas (54.0%) than the rural areas (46.0%). This might be due to change in lifestyle of people living in urban areas. Based on diet, loss of first molars are seen in patients having non-vegetarian diet (80.8%) than patients having vegetarian diet (19.2%). Based on occupation labourers has shown higher prevalence of missing first molars, it can be because

of low socio-economic status, decreased oral health awareness. Vertical method of tooth brushing showed better oral hygiene than other methods.

Based on occlusal analysis, 383 patients showed tilting of adjacent tooth and 467 showed supra eruption. Artun and Thalib in 2011 also stated the prevalence of loss of first molar and mesial migration was more common in mandible 70%. [13]

CONCLUSION

The prevalence of missing molars in south canara district population is 48.65%. Mandibular left first molar loss (63.6%) is more prevalent. Dental caries is the common etiological factor for loss of first molar. The prevalence of loss of first molars is most commonly seen in urban areas (54.0%) than the rural areas. Hence the need for oral health education and awareness is very crucial among the indian population to prevent this further loss of teeth.

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