Prevalance of first permanent molar caries among 7-10 years old school going boys in Abha city, Saudi Arabia

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Abstract:

Objective: Dental caries is one of the most prevalent chronic diseases affecting children and in particular first permanent molar is more vulnerable to caries because of its morphological and functional characteristics. The purpose of the present study was to determine prevalence of first permanent molar in 7-10 years old school going boys in Abha, Saudi Arabia. Materials and Method: This cross-sectional study was carried out on 836 school children, selected randomly from private and public schools of Abha, Saudi Arabia. All students were examined for Dental caries using the world health organization criteria by trained examiners. Data was analyzed using Chi-square and Fischer's exact t test. Results: The point prevalence of dental caries in first permanent molar was recorded to be 66.4% with an average DMFT of 2.74±1.18. Prevalence increases consistently as age increased. Mandibular first permanent molar exhibited higher caries prevalence than its Maxillary counterpart. Public schools exhibited higher caries prevalence than private school students. Conclusion: Caries prevalence among 7-10 years old

students in Abha, Saudi Arabia is higher than the global standards of WHO and FDI for 2010.Hence adequate preventive measures are essential to be implanted at the earliest to bring down the current caries prevailing rate.

Keywords: Dental caries, Permanent first molar, Decayed Missing and Filled teeth (DMFT), oral cavity.

Introduction:

Dental caries is a multi-factorial disease involving various factors such as diet, microorganisms, tooth morphology, saliva, as well as genetic pre disposition. Apart from these other related factors such as social, environmental and cultural factors are also responsible. Oral health surveys gives an idea about the population's oral health status, treatment needs as well as provides baseline information to establish oral health plans as per the actual needs of their population.[1] DMFT is considered to be an important index to determine the caries status in an individual. As per WHO, the average DMFT of not more than 3 in the year 2000 and not more than 1 in 2010 at the age of 12. [2]

First permanent molar is more vulnerable to caries due to its morphologic and functional characteristics, as well as to the surrounding conditions the newly erupted permanent molars have to face. McDonald (1992) pointed out an high frequency of occlusal caries on the permanent first molar for all age groups, concluding that occlusal surface of first permanent molar remains the most common site for caries within a short period following its eruption.[3] Hescot and Roland (1993) report that by the age of six 4.9%of the children already have caries on first permanent molar. [4] The significance of the first permanent molar cannot overemphasized as it form the key to occlusion and its early loss due to caries can have a significant impact on the future dental health of the child.

Several studies have investigated the prevalence of Dental caries though not exclusively on first permanent molar in Saudi School children. El Amoudi et al (1996), studied a young age group of 6-9 years old in Jeddah and reported that the mean DMFT was 4.23 .[5] Al Khateeb et al (1991) studied the prevalence of caries and treatment needs among 6-12 years school children in Jeddah and concluded that mean caries experience in deciduous tooth was 2.9 in private schools and 6.3 in public schools.[6] While regarding studies exclusively on dental caries in permanent first molar, Warren J J, Hand J S, Yao J H (1997): conducted study on first permanent molar caries in 333 first grade children attending school in Taiwan and found that mean DMFT was 1.19. [7] Mostafa Sadeghi (2007) conducted study on first molar caries in 12 years old student in private and public school in Rafsanjan, Iran and concluded that mean DMFT for first permanent molar was 1.9 ± 1.6(1.83 for boys,1.98 for girls).[8] Ali H. Hassan, Hala Amer, Adel Moussa and Hassan Gaznawi (2005), studied caries prevalence among school students in Jeddah and reported DMFT 2.5 in 9-12 years, 3.46 in 13-15 years, 4.31 in 16-18 years old.[9] .

Although several studies have been reported on prevalence of Dental caries among school children in Saudi Arabia, there has been a dearth in data regarding the caries prevalence in this southern region of Saudi Arabia..The purpose of present study was to determine the prevalence of Dental caries in first permanent molar among 7-10years old school boys in Abha city of Saudi Arabia.

Material and methods:

The present was carried out by the Department of Paediatric Dentistry, College of Dentistry, King Khalid University, Saudi Arabia to assess the prevalence of Dental caries in first permanent molar among 7-10 years old school boys in Abha. A two stage stratified sample of 836 school boys from 8 out of 50 primary

schools in Abha was randomly selected for the study. The study sample included 7 to 10 years age group from both private and public schools. In the first sampling stage, all the primary

Table 1: Number of children with and without caries in first permanent molar

	Number of children	%
Caries	555	66.4
Caries free	281	33.6
Total	836	100.0

Table 2: Mean DMFT in first permanent molar as per age

Age group	Number of teeth examined	Number of Decayed Teeth	Decayed Teeth %	Decayed Mean+-SD	Number of Missing Teeth	Missing Teeth %	Missing Mean+-SD	Number of Filled teeth	Filled Teeth %	Filled Mean+-SD	DMFT Mean+-SD
7	624	90	14.4	1.84±0.87	0	0.0	0.0	2	0.3	0.04±0.20	1.88±0.98
8	1016	364	35.8	2.41±1.28	0	0.0	0.0	1	1.1	0.07±0.28	2.48±1.29
9	860	490	56.9	2.83±1.04	1	0.12	0.01±0.08	8	0.9	0.05±0.21	2.88±1.05
10	844	507	60.1	2.79±0.99	3	0.35	0.02±0.13	44	5.2	0.24±0.53	3.04±1.12
P-value		χ^2=397.0(3); P<0.001**		<0.001**	P=0.217 (Exact test)		0.298	χ^2=64.5(3) P<0.001**		<0.001**	<0.001**

Table 3: DMFT in Maxillary and Mandibular permanent first molar

Max/mand	Number of Teeth examined	Decayed		Missing		Filled	
		No	%	No	%	No	%
Maxillary	1672	601	35.9	1	0.06	18	1.1
Mandibular	1672	850	50.8	3	0.18	47	2.8
Total	3344	1451	43.4	4	0.12	65	1.9
P value		χ^2=75.5(1); P<0.001**		P=0.387(Exact test)		χ^2=13.40(1); P<0.001**	

Table 4: DMFT in first permanent molar as per Laterality

Laterality	Number of teeth examined	Decayed		Missing		Filled	
		No	%	No	%	No	%
Unilateral	1672	720	43.1	3	0.18	38	2.3
Bilateral	1672	731	43.7	1	0.06	27	1.6
Total	3344	1451	43.4	4	0.12	65	1.9
P value		$\chi^2=0.141(1)$; P=0.701		P=0.387 (Exact test)		$\chi^2=1.90(1)$; P=0.168	

Table 5: DMFT in First permanent molar as per School

School	Number of teeth examined	Decayed		Missing		Filled	
		No	%	No	%	No	%
Government	2004	1245	62.1	3	0.15	49	2.4
Private	1340	206	15.4	1	0.07	16	1.2
Total	3344	1451	43.4	4	0.12	65	1.9
P value	-	$\chi^2=715.0(1)$; P<0.001**		P=0.739 (exact test)		$\chi^2=6.59(1)$; P=0.010*	

schools were classified in to 4 groups according to geographic location. Then using the equal allocation method two schools were selected from each of four groups, so that there was one private and one public school in each region. In the second sampling stage, 4 classes were selected randomly from each of the selected school to represent the different grades. Thus, a total of 36 classes were included in the sample. Each class was considered to be a cluster, and all the boys in the selected classes constituted the target group of the present study. Children above the age of 10 years were not included in the study.

The participants and their parents were informed of the nature of the study and a consent form, approved by the Institutional Review Board, was signed by each participant's parent prior to the study. The clinical examination was performed in the schools where the students were enrolled .A Questionnaire was designed to record personal profile of the student and their DMFT index for first permanent molar. Two previously trained and standardized examiners performed the dental examinations and a trained assistant recorded the observations. Calibration procedures were performed prior to and during the study to ensure that a consistent standard of the diagnosis was maintained. Re-examinations were carried out on approximately one in ten children selected at random to have a constant check on the inter examiner variability. The criteria used for diagnosing caries were according to WHO 1997 criteria. The examinations were carried out in classrooms and performed under fluorescent lighting with patient sitting on normal chair using cycle and cow horn two headed Dental explorer and plane mouth mirror to record Decayed, Missing and

Filled teeth (DMFT) in the first permanent molar. The early status of dental caries that could not be diagnosed positively was excluded. They were hard stained pits and fissures, rough spots in enamel which catches an explorer but do not have detectable softened cavity floor.The data gathered was analysed using Chi square and Fischer Exact test using Statistical software namely SAS 9.2, SPSS 15.0, Stata 10.1, MedCalc 9.0.1 ,Systat 12.0 and R environment ver.2.11.1 .Microsoft word and Excel have been used to generate graphs, tables etc.

Results:
Of the total 836 school boys examined 66.4% had caries in first permanent molar (Table1). The point prevalence of Dental caries in first permanent molar in different age groups was 1.88, 2.48, 2.88 and 3.04 for 7, 8, 9 and 10 years age group respectively (Table 2), indicating that as age increased the DMFT also increased correspondingly. There was statistically significant difference between children who had caries and caries free in 7 years, 9 years and 10 years age group.
Regarding comparison between the DMFT between Maxillary and Mandibular permanent first molar has been shown in Table 3, while the DMFT comparison between Unilateral versus Bilateral first permanent molar is shown in Table 4. Public school students exhibited significantly higher level of DMFT than private school students is shown in Table 5.

Discussion:
The present study investigated the prevalence of Dental caries in First permanent molar among various age groups of Abha school population. The present study was exclusively on First permanent molar since they play a key role in maintaining the Dental and overall health of an individual. First permanent molar are the first permanent tooth to erupt and exhibit a greater control over the teeth that erupt later behind and in front of them as they are forced to position to the already erupted and in occlusion

functioning first molars. Moreover, they are the largest tooth in oral cavity and bear the maximum occlusal load. They are positioned in oral cavity in such a way that they influence the vertical distance of maxilla and mandible, the occlusal height and aesthetic proportions.[10] Apart from this, since they have the maximum root surface area they are considered to be best source of anchorage for moving the tooth.

Above all the health of this tooth in particular can form a good basis to assess the oral health status of these children, since this tooth is more vulnerable to caries than others because of its functional and morphological characteristics.[11]

In this study 33.4% of the students were caries free and DMFT for first permanent molar was 1.88, 2.48, 2.88 and 3.04 for 7, 8, 9 and 10 years age group respectively. As age increased the Mean DMFT also increased. These results are in agreement with others obtained from developed countries, such as United Kingdom [12], where the DMFT was 2.55.The reason for caries being more as age increased can be attributed to the fact that caries being a continuous and cumulative process had obviously increased.

The other important finding that we found was that Mandibular first permanent molar exhibiting statistically significant higher Decayed and filled component of DMFT than their Maxillary counterpart. This finding is in concurrent with that of studies conducted by Serban, Maxim and Balan.[13] The reason for Mandibular first permanent molar exhibiting higher DMFT shall be that, its Morphology and eruption time. Mandibular first permanent molar has more number of pits and supplementary grooves which can act as food retentive areas promoting caries. The other factor could be that in majority of children Mandibular first permanent molar erupts slightly earlier than its Maxillary counterpart, hence Mandibular first permanent molar being exposed to the oral

environment for a longer period of time, making it more susceptible to caries than Maxillary First permanent molar.

Moreover in this study we saw that Public school students exhibiting higher DMFT than the private school students. There was statistically significant difference in the Decayed and filled component of DMFT between Public school students and private school students. Similar findings have been reported in Saudi Arabia, Jordan [14] as well as in Syria.[15] Probable reason for this could be lack of access to health education, preventive Dental programs and school Dental services for the public school students.

Conclusion:

1.High prevelence of permanent first molar Caries among school children examined in this study.

2.Prevalence of caries in first permanent molars increased with age.

3.Caries Prevalence in Mandibular first permanent molars was significantly higher than maxillary first permanent molars.

4.DMFT score of Private School children was lower than Public School Children ..

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