



ORIGINAL ARTICLE

Evaluation of the prevalence of caries in the second deciduous molar and adjacent first permanent molar in children of 6-12 years.

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ABSTRACT... Objective: To evaluate the prevalence of caries in second molar deciduous molar and adjacent first permanent molar in children. **Study Design:** Cross Sectional study. **Setting:** Dental Outdoor Department of Ibn-e-Siena Hospital. **Period:** March 2021 to August 2021. **Material & Methods:** A total of 1,250 patients between the age of 6-12 years were included in the study, who were free from the other dental issues. Consent was taken from the patients and parents after explaining the procedures. Examination was done by a senior Operative dentist. For diagnosis of the caries ICDAS criteria was undertaken. **Results:** A total of 1250 children between the age of 6-12 years were included in the study. Out of these 250 children had first permanent molar caries. Boys were effected more and second deciduous molar tooth caries were associated with development of caries first permanent molars as these are closely placed. **Conclusion:** Association between presence of caries in primary teeth is correlated with the development of caries in the permanent teeth. So caries in the primary teeth, predicts the development of caries in the permanent teeth.

Key words: Caries, First Permanent Molar, Primary Teeth.

INTRODUCTION

Caries in primary and permanent teeth is a common dental problem of this modern era, which affects children over all health and wellbeing. It may manifest as demineralization, crown destruction and loss of tooth (if left untreated).¹ Early childhood caries can be defined as “the presence of one or more decayed, missing or filled teeth in any of the teeth of primary dentition,” according to the American Academy of Paediatric Dentistry. Various factors are implicated in the development of dental caries.³ Among these are baby bottle frequent use, eating habits, consuming more sugary food, poor oral hygiene, malnutrition, deficiency of fluoride and vitamin D, prolonged on demand feeding, infrequent tooth brushing.^{1,2,3,4}

Eruption of primary teeth starts at the age of 6 months and this process get completed at the age of 3 years. Primary teeth are more susceptible to caries and are important indicator of caries in

permanent dentition. So these are very important for the overall oral health of children.⁵ Literature showed that caries are more prevalent than asthma among 5 to 17 years old American children.⁶ And in China its prevalence has increased during last ten years and it is observed that it is more common in girls than boys.⁷

First permanent molar tooth erupt at the age of 6-7 years and is considered most vulnerable to caries. This may be because of the early exposure to the oral environment, high carbohydrate diet, lack of oral hygiene maintenance, infrequent tooth brushing and parental unawareness about the time of eruption of permanent molar.^{5,8,9}

Association between presence of caries in primary teeth with the development of caries in the permanent teeth is described in previous studies. So caries in the primary teeth, predicts the development of caries in the permanent

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teeth.⁹ Undetected Caries in the permanent molar may result in severe dental pain or sensitivity, difficulty in eating, improper child sleep and disturbed behaviour, destruction of tooth crown and ultimately the loss of teeth. Extraction of the first permanent molar may also be considered in orthodontic problems, peri apical pathology, enamel hypo mineralization or hypoplasia.⁹

So, it is very important to identify the caries in the first permanent molar at the earliest stage so that early preventive measures and interventions may be implicated to avoid early loss. 3rd molar may be missing due to congenital reason or extraction due to caries. In this scenario, loss of first permanent molar may lead to malocclusion of other teeth.⁵ So keeping in view the importance of first permanent molar in permanent teeth and effect of carious primary teeth especially second deciduous molar on carious status of first permanent molar, this study was conducted to know the frequency of caries in the second deciduous molar and first molar at early age and to emphasize on awareness of eruption of first permanent molar and its importance for retention in oral cavity among parents.

MATERIAL & METHODS

It was a cross sectional study conducted in the dental outdoor patient department of Ibn-e-Siena hospital from March 2021 to August 2021 to after taking approval from the ethical committee with reference No. Publi/7/21. A total of 1,250 patients between the age of 6-12 years were included in the study because first permanent molar erupt during 6-8 years, who were free from the other dental issues like trauma, MIH etc. Consent was taken from the patients and parents after explaining the procedures. Examination was done by a senior Operative dentist on examination chair under good light and with mirror for presence of caries in first. For diagnosis of the caries ICDAS¹⁰ criteria was undertaken. All participants were examined on examination chair under good light using sterile mirror, WHO probe and cotton rolls (for clean, dry field). Second deciduous molar and first permanent mandibular and maxillary molar were examined for presence/ absence of dental caries.

Data were entered and analysed by using SPSS 20. Chi square test was used to evaluate the significance. A P value of ≤ 0.05 was taken as significant difference.

RESULTS

A total of 1250 children were evaluated who were between the age of 6-12 years in this study. Out of these 250 children had first permanent molar caries and 220 had carious second deciduous molar. Gender distribution among children who were free of caries and those who have carious first permanent molar is shown in the Table-I and the difference was not statistically significant with a p value of 0.07. With regard to age groups in children with carious first permanent molar, it was observed that majority of children were in the age group of 6-8 years followed by 9-10 years as shown in Table-II.

		Caries Free	Caries	Total
Gender	Boys	550(44%)	101(8.08%)	651(52.08%)
	Girls	450(36%)	149(11.92%)	599(47.92%)
	Total	1000(80%)	250(20%)	1250

Table-I. Gender distribution among study population with first permanent molar

Age	Frequency Caries First Molar (%)
6-8	150 (60%)
9-10	70 (28%)
11-12	30 (12%)

Table-II. Age distribution among patients with carious first permanent molar

1st permanent molar was examined for the presence of caries and in majority of the children (130/250) have carious involvement of both maxillary and mandibular followed by mandibular (111/250) as shown in the Figure-1.

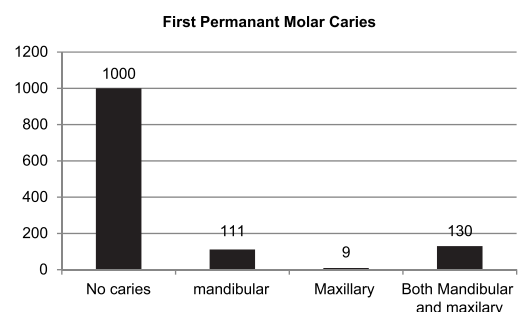


Figure-1. First permanent molar caries distribution.

Frequency of caries in second deciduous teeth was 17.6% and in this also most of the children have both maxillary and mandibular molar caries followed by mandibular as shown in the Figure-2. When children were compared regarding carious first permanent molar with children with deciduous second molar and noncarious second deciduous molar, it was found that that children with deciduous second molar have significantly more caries in first permanent molar with p value of 0.003.

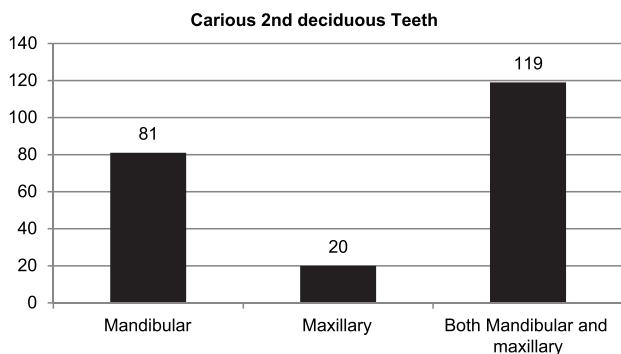


Figure-2. Carious 2nd deciduous Teeth.

Awareness among parents regarding time of eruption of the first permanent molar and caries in it was also assessed and most of the parents were not aware of the presence of first permanent molar and caries in it as shown in the Figure-3.

Awareness regarding presence of caries in FPM and eruption time of FPM

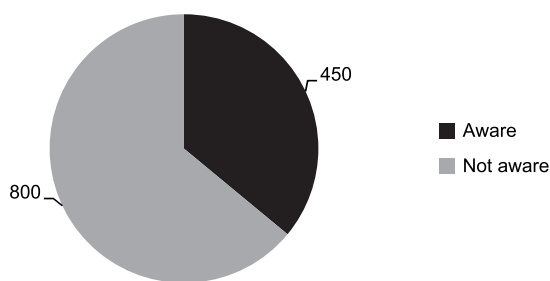


Figure-3. Parental awareness about caries in first permanent molar and eruption time

DISCUSSION

Caries is quite prevalent in the developing countries and first permanent molar is at greater risk of caries because of early eruption and cariogenic environment faced during mixed dentition (as it's a school going age and more exposure of a child to cariogenic diet and

snacks). Also carious primary teeth are risk factor for the development of caries in permanent first molar. In the present study 1250 children were evaluated for the presence of caries in the 2nd deciduous tooth and first permanent molar. In this, it was found 20% of first permanent molar were carious, which was high from the target set by WHO global aim of 11% by 2020 in the first permanent molar.¹¹ Though the frequency is low compared to the studies conducted in the neighbouring countries. A study conducted in Iran showed 1323 out of 2256 children have carious first permanent molar.¹¹ Another study from Libya found prevalence of 45% in children.¹² In West coast of India prevalence of caries in the first permanent molar as observed to be as high as 83%.¹³ In Dammam Saudi Arabia 49.8% of children was found to be having carious first permanent molar caries.¹⁴ One study from Karachi, Pakistan showed frequency of caries in the first permanent molar in 30.6% children.¹⁵ Lower frequency of caries in the current study may be due to the difference in the dietary habits, fluoride drinking water and urban population, as studies have shown that frequency of caries is high in rural areas.⁵

Male predominance was observed in the present study with 52.08% boys and 47.92% girls, though the difference was not statistically significant with a p value of 0.07. In previous studies female predominance was observed, as described by a study from Sudan.¹⁶ Khan et al found no significant relationship between caries and gender in which girls have high caries compared to boys.¹⁴ Current study findings are in agreement with Sudhakaran et al, who also did not find significant relation between gender and caries in the first permanent molar.¹³ In this study majority of the children were of age group 7-8 years. Mohammad et al also have similar findings in the study conducted at Benghazi.¹²

Second deciduous tooth was found to be carious in 17.6% children in this study and also had carious first permanent in these children. There was a significant difference in the children with early childhood caries and first permanent molar caries. It was also observed that those who

underwent treatment for early childhood caries and those who do not seek treatment, there was no significant relation with regard to the frequency of caries in the first molar but these children have better oral health. These findings are similar to the current study.⁶

In the present study majority children have carious both mandibular and maxillary molars. Mandibular molars have more incidence of caries compared to maxillary molar.^{12,17} These are in agreement with current study.

CONCLUSION

So it can be concluded from the study that caries is quite prevalent in first permanent molar.

Early childhood caries has an impact on the development of caries in the first permanent molar as first permanent molar erupt in most children between the age of 6 to 8 years. Though improvement of the oral health and treatment of early childhood caries have not totally eliminated the risk of caries development in the first permanent molar. But it can decrease the caries frequency in permanent dentition. So by frequent follow ups, parental counselling regarding improvement in dietary habits, giving diet diaries and helping them identifying hidden sugars in addition to frequency and type of overall sugar intake, child behaviour management, oral hygiene reinforcement, fluoride therapy, use of pit and fissure sealant in high caries risk patients, giving preventive resin restorations (if required by early detection) with frequent follow ups and ensuring dental awareness among parents about time of eruption and incipient caries presence in the first permanent molars, over all caries risk in permanent dentition can be reduced.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Rabia Zafar	Study design, data collection, writing the manuscript formulation of tables reviewed and approved.	<i>Rabia Zafar</i>
2	M. Athar Khan	Statistical analysis, result interpretation, manuscript writing and revising it critically for important intellectual content.	<i>Muhammad Athar Khan</i>
3	Syed Jaffar Hussain Bukhari	Statistical analysis, interpretation of results, Reviewed and approved the manuscript.	<i>Syed Jaffar Hussain</i>
4	Asma Shakoor	Data collection, writing the manuscript, formulation of tables reviewed and approved.	<i>Asma Shakoor</i>
5	Javed Iqbal	Result interpretation, manuscript writing and revising it critically for important intellectual content.	<i>Javed Iqbal</i>