

The Prevalence and Severity of Dental Caries and Oral Hygiene Status of Asthmatic Children between the Age Group of 6 and 12 Years: A Cross-Sectional Study

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ABSTRACT

Aim: To assess the prevalence and severity of dental caries and oral hygiene status of 6 to 12 years old children with bronchial asthma.

Materials and methods: The study population consisted of 500 children between the age group of 6 and 12 years old, who were diagnosed with bronchial asthma and were under medication. DMFT score was assessed by WHO criteria (1997) and oral hygiene status was assessed by simplified oral hygiene index (OHI-S) by Greene and Vermillion (1964).

Results: The data was collected and analyzed using the SPSS package. 15.6% of females had good oral hygiene status when compared to males who almost had 12.6 and 20.8% of children who were in the category of moderate persistent asthma had decayed teeth whereas only 4% of children in severe persistent asthma category had experienced with decayed teeth.

Conclusion: Moderate persistent group of asthmatic children who were consuming orobronchodilator form of medication are found to have high prevalence of dental caries than dry powder and metered dose inhaler.

Keywords: Bronchial asthma, DMFT score, OHI score.

How to cite this article: Anandhan V, Bharathan R, Venkataraghavan K, Reddy NV. The Prevalence and Severity of Dental Caries and Oral Hygiene Status of Asthmatic Children between the Age Group of 6 and 12 Years: A Cross-Sectional Study. *World J Dent* 2012;3(3):250-254.

Source of support: Nil

Conflict of interest: None declared

INTRODUCTION

Dental caries or early loss of teeth may lead to malnutrition and other health problems. Caries and its complications affect the quality of life. Premature loss of primary teeth can result in a variety of adverse consequences, such as gastrointestinal disorders, esthetic and psychological problems.^{1,2}

The prevalence pattern of dental caries not only varies with age, sex, socioeconomic status, race, geographical location, food habits and oral hygiene practices but also within the oral cavity.³

Dental caries in India is consistently increasing in prevalence and severity especially in children, today according to a number of investigators, 70 to 80% are

suffering from this disease. The average number of decayed, missing and filled teeth at the age of 6 to 12 years is about 4 in rural and 5 in urban areas.^{4,5} Dental caries is almost affected by many systemic diseases. In that bronchial asthma is one of the major systemic diseases which is commonly affecting children.⁶ Asthma has a worldwide prevalence rate of 2 to 33% in childhood, a period of development when the effects of chronic disease and long-term medication are of particular concern.⁷

Dental and other oral health problems are also frequent in this age group. Frequent oral inhalation of these sugar containing drugs combined with the decrease in salivary flow rate may contribute to the increase in the risk of caries. Consumption of cariogenic drinks, in an attempt to wash away the taste of the inhaled medication and to counter the desiccating effect of mouth breathing and the reduction in the salivary flow caused by beta 2 agonist, can also be a reason for the increase in the caries rate in asthmatics.^{8,9} Hence, the study was conducted to assess the prevalence and severity of dental caries and oral hygiene status of 6 to 12 years old children with bronchial asthma.

MATERIALS AND METHODS

The present study, was conducted in a private hospital exclusive for bronchial asthma and the study population consisted of 500 children between the age group of 6 and 12 years old, who were diagnosed with bronchial asthma and were under medication as advised by their physician. The survey commenced after a letter of information regarding the objective and procedure of the study was handed over to the concerned authority in advance and permission was obtained. The children were divided into 4 groups like intermittent, mild, moderate and severe as per the severity of asthma.

The clinical examination was carried out and details regarding the past medical history of bronchial asthma and frequency, dosage and form of medication, previous dental visit of the patient, diet histories, frequency and duration of brushing details were also collected from parents or legal guardian with the help of a structured questionnaire. After which the oral examination of asthmatic children was done using sterile instruments.

DMFT score was assessed by WHO criteria (1997) and oral hygiene status by simplified oral hygiene index (OHI-S) by Greene and Vermillion (1964). All examinations were conducted by a single trained examiner and a trained recording clerk assisted the examiner in the survey. Participants received instructions related to oral hygiene maintenance at the end of the clinical examination.

STATISTICAL ANALYSIS

Data was analyzed by using SPSS (statistical packages for social sciences) for Windows XP. Interexaminer reliability and intraexaminer reliability was used to compare variables. A result of less than 0.005 was chosen as the statistical level of significance for all calculations.

RESULTS

The study population consisted of 500 asthmatic children between the age group of 6 and 12 years. Intraoral

examination was carried out and the values were recorded using DMFT index (WHO Criteria—1997) and simplified oral hygiene index (Greene and Vermillion—1964) (Table 1).

It is evident that 14.8% of male children and 22.8% of female children found to have decayed teeth. In contrast 13.6% of female children and 8.8% of male children were seem to have filled teeth (Table 2).

It was observed that 12.2% of male children and 15.6% of female children were found to have good oral hygiene while 12.6% of male children and 26% of female children had fair oral hygiene (Table 3, Graph 1).

Out of 500 children, it was found that 20.8% of the children in the moderate persistent category had high prevalence of dental caries, whereas 2% of the children in the intermittent category were found to have low prevalence of dental caries (Table 4).

In the intermittent group, 6.2% of them were found to have good oral hygiene, while 4.6% of them had fair oral hygiene (Graph 2).

Table 1: Dental caries status based on gender distribution

Sex	Subject	Decayed	Filling	Missing	Sound
Male	Number	74	44	14	54
	Percentage	14.8	8.8	2.8	10.8
Female	Number	114	68	28	87
	Percentage	22.8	13.6	5.6	17.4
Total	Number	188	112	42	141
	Percentage	37.6	22.4	8.4	28.2

Table 2: Oral hygiene status based on gender distribution

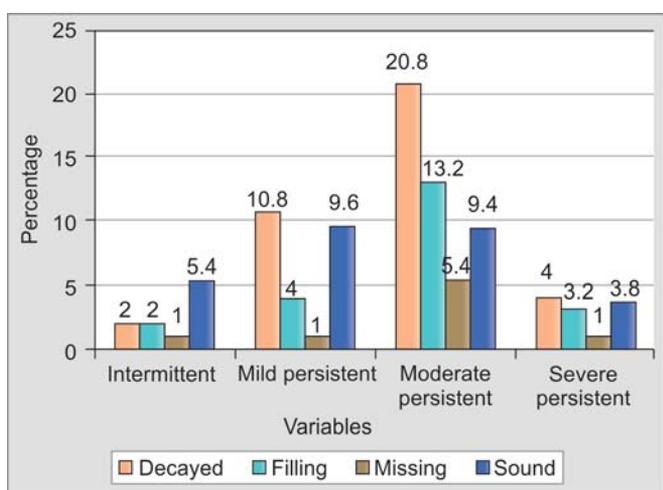
Gender	Subject	OHIS		
		Fair	Good	Poor
Male	Number	63	61	193
	Percentage	12.6	12.2	38.6
Female	Number	130	78	99
	Percentage	26.0	15.6	19.8
Total	Number	193	139	168
	Percentage	38.6	27.8	33.6

Table 3: Dental caries status based on severity of asthma

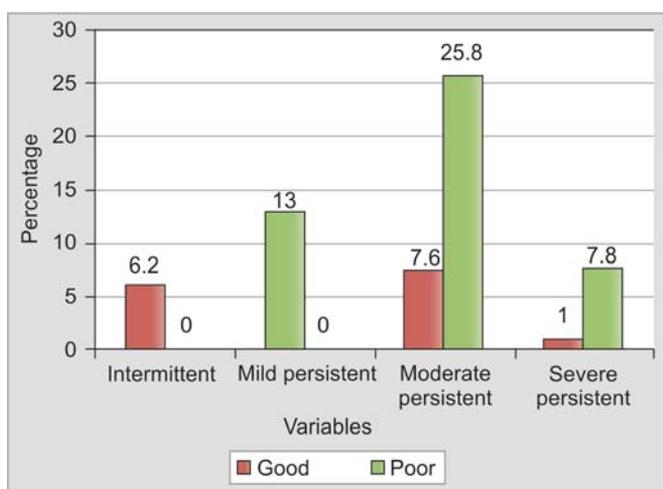
Dental caries	Subject	Severity of asthma			
		Intermittent	Mild persistent	Moderate persistent	Severe persistent
Decayed	Number of children	10	54	104	20
	Percentage	2	10.8	20.8	4
Filling	Number of children	10	20	66	16
	Percentage	2	4	13.2	3.2
Missing	Number of children	5	5	27	5
	Percentage	1	1	5.4	1
Sound	Number of children	27	48	47	19
	Percentage	5.4	9.6	9.4	3.8

Table 4: Oral hygiene status based on severity of asthma

OHIS	Subject	Severity of asthma			
		Intermittent	Mild persistent	Moderate persistent	Severe persistent
Fair	Number of children	23	64	87	19
	Percentage	4.6	12.8	17.4	3.8
Good	Number of children	31	65	38	5
	Percentage	6.2	13.0	7.6	1.0
Poor	Number of children	0	0	129	39
	Percentage	0	0	25.8	7.8
Total	Number of children	54	129	254	63
	Percentage	10.8	25.8	50.8	12.6



Graph 1: Dental caries status based on severity of asthma



Graph 2: Oral hygiene status based on severity of asthma

In mild persistent group, 13% of the children were seen to have good oral hygiene, while 12.8% of the children had fair oral hygiene and in the moderate persistent group, 7.6% of them were observed to have good oral hygiene and 17.4% of them had fair oral hygiene.

In the severe persistent group, 1% of the subjects were seen to have good oral hygiene and 3.8% of the subjects had fair oral hygiene. It was observed from this study that moderate and severe persistent groups had higher percentage of poor oral hygiene status.

DISCUSSION

An overall increase in the prevalence of dental caries was seen in the subjects of bronchial asthma. There may be numerous reasons for the higher prevalence of caries in asthmatic children.¹⁰

A large number of studies have considered asthma as a risk factor in the occurrence of dental caries. According to some reports, asthmatic patients suffer more from the two main oral diseases, caries and periodontal disease, than nonasthmatic subjects.^{11,12}

Asthma had a worldwide prevalence rate of 2 to 33% in childhood, a period of development when the effects of chronic disease and long-term medication are of particular concern. Dental and other oral health problems are also frequent in this age group.¹³

In the present study, the results showed that about 15.6% of females had good oral hygiene status when compared to males who almost had 12.2%.

Milano et al had conducted a study on prevalence of oral hygiene status in asthmatic children and he found 21.5% of females had good oral hygiene, which almost coincides this study.¹⁴

The results of this study showed that about 20.8% of children who were in the category of moderate persistent asthma had decayed teeth where as only 4% of children in severe persistent asthma category had decayed teeth.

Malin Stensson et al and Ida Anjomshoaa et al who found that the high prevalence of dental caries was seen in moderate persistent category of children and low prevalence

of dental caries was seen in severe persistent asthma category, which clearly is in line with the results of this study.^{15,16}

This present study showed about 17.6% of the children who were using metered dose inhaler had good oral hygiene status whereas 6.5% of children who were advised oral bronchodilator had a poor oral hygiene. It was interesting to see that the children who were using metered dose inhaler had a good oral hygiene status and in turn they had a least dental caries score. The brushing frequency alone does not help in maintaining oral hygiene. It should be in combination with proper brushing techniques, which can be incorporated in these children with various measures by creating awareness.^{17,18}

The result of this study highlights the points that it is essential to develop individualized intensive preventive dental programs for asthmatic children according to their age, since they are at higher risk for dental caries.

Also due to increase attention given to their general asthmatic condition, parents may give little importance to oral hygiene procedures. The removal of plaque and debris from the teeth is a skill that can be mastered only when an individual has the dexterity to manipulate the toothbrush and understands the objectives of these activities. The success of good oral hygiene reflects the skill, dedication, and motivation of an individual or those who are responsible for it. The brushing frequency alone does not help in maintaining oral hygiene. It should be in combination with proper brushing techniques, which can be incorporated in these children with various measures by creating awareness.^{19,20}

CONCLUSION

The results of the study reveals that the inhalers used for asthma and the drugs used in it are seen as a risk factor for dental caries and poor oral hygiene status. Proper oral hygiene instructions should be given to the children as these drugs are acidic in nature and often have side effects, the children should be persuaded to get into the habit of rinsing the mouth immediately after using the inhaler with basic mouth rinses which has neutral pH, such as liquid antacids, sodium bicarbonate in water, milk or neutral sodium fluoride mouth rinses. Children should also be instructed not to brush their teeth immediately after exposure to acids as it may damage the already weakened enamel. The parents of the children with asthma should be educated and informed about the nature of this medical condition and how it increases their susceptibility to dental caries. Therefore special oral health attention should be provided to asthmatic children to improve their quality of life. Moreover, it can be recommended that dentists should be included in the multiprofessional team involved in asthmatic assistance.

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