The prevalence of dental caries and periodental disease in asthmatic patient

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Abstract

The prevalence of asthma has been increasing since the 1980. Asthma and tooth decay are the two major causes of school absenteeism. There are few studies present in the literature. The objectives of the present study were to know the severity of dental caries and periodental problems in children before and after taking antiasthmatic medication. The present study was conducted on 105 six- to fourteen year-old asthmatic children to determine the condition of the dental caries and their periodental status. Before and after taking antiasthmatic medication for a period of 1 year and these were matched with their countries, The results showed that salbutamol inhaler shows inceased caries rate with high significance over other groups, which was followed by salbutamol tablets and beclamethasone inhaler respectively. It has been concluded that antiasthmatic medication has its effects on dental caries and periodental disease and asthmatic patients are recommended to adopt more precautionary oral hygiene practices and keep their caries activity and periodental health under constant check.

Introduction

Asthma is a chronic inflammatory condition of the airways characterized by hyper-responsiveness and episodic, reversible symptoms of airflow obstruction. The prevalence of asthma has been increasing since the 1980s across all ages, gender and racial groups and are higher among children than adults. Asthma and tooth decay are the two major causes of school absenteeism. Asthma is viewed by many as a fairly benign disorder; the mortality rate for this disease has almost tripled during the last 20 years, reaching a peak of more than 3,000 annual deaths, This number is projected to be doubled within the next, two decades.[4]

Children with chronic medical disorders requiring long-term medication are at a risk of dental caries as a side effect[5] A possible mechanism for an effect on dental .caries cod's be the involvement of padrenoceptors in asthma, with an effect also on salivary gland function, Asthma is frequently treated with B adrenoceptor agonists, which promote bronchial relaxation, B adrenoceptors are also present in the secretory system and have a strong impact on salivary composition.[6] A dose-response effect of the treatment with P2 adrenoceptor agonists is the impairment of salivary secretion and it also has an effect on its composition in asthmatic patients.

This study was performed with an objective to determine the effect of antiasthmatic medication, i.e., salbutamol inhaler, salbutamol tablets and beclamethasone inhaler on dental caries and periodental disease over a period of 1 year.

Materials and method

A case control study with 1 -year follow-up was chosen, which included 143 asthmatic children as cases, but 38 children did not report after the study period. One hundred five asthmatic children in the age group of 6-14 years were followed up after 1 year, one hundred six controls were taken from different schools and followed up for 1 year. The data was collected in the outpatient block of the hospitals, with the patient seated in a normal chair, with the help of a hand torch and using sterile instruments. The dental caries and periodental status of the patients were examined and noted before starting the medication and at the end of 1 year.

The cases were divided equally into three groups, with 35 patients in each group – viz. beclamethasone inhaler group and salbutamol inhaler and tablet groups. All examinations were conducted by the same examiner, while a trained clerk assisted in the survey. The patients were recalled after 1 year arid examined again. Dental caries were assessed using DMFT, DMFS, dft and dfs indices and periodental status was determined by using CPITN index. The data was analyzed by statistical analysis. A 'p' value of <0.05 was considered as statistically significant.

Results

The results revealed that salbutamol inhaler group exhibited increased caries rate with high significance over other groups; which was followed by salbutamol tablet group, which had significant increase in caries as compared to controls, but not significant, compared to beclamethasone inhaler group [Table 1],

Table 1: Comparison of differences in dental caries status between various groups

Groups		dft	dfs	DMFT	DMFS
Controls (n=1 06)		0.14 ±0.38	0.14 ±0.38	0.40 ± 0.66	0.43 ± 0.66
Bed. Inh (n=35)		0.43 ±0.74	0.54 ± 0.89	0.22 ±1.35	0.42 ± 0.50
Salb. Inh. (n=35)		1.31 ±2.25	1.23 ±1.35	1.40 + 1.19	2.00 ±1.66
Salb. Tab (n=35)		0.46 ± 0.56	0.63 ±0.77	0.80 ±1.16	0.89 ±1.37
ANOVA F		11.58	18.18	11.16	22.59
P		< 0.001, HS	< 0.001, HS	< 0,001, HS	< 0.001, HS
Difference	1-2	P< 0.05,5	P<0.01, S	P=0.63, NS	P=0.70NS
between groups	1-3	P< 0.001, HS	P< 0.001, HS	P< 0.001, HS	P< 0.001, HS
	1-4	P<0.01. S	P< 0.001, HS	P=0,07, NS	P=0.09, NS
	2-3	P<0.05, S	P<0,05. S	P< 0.001, HS	P< 0.001, HS
	2-4	P = 0.47, NS	P=0.37, NS	P=0.25, NS	P = 0.25, NS
	3-4	P = 0.08 NS	P=006, MS	P=005, S	P=000, HS

Discussion

Asthmatic inflammation is characterized by bronchial hyper-reactivity and therefore differs from the inflammation seen in other conditions. The chronic results are airway odema, smooth muscle hypertrophy, epithelial shedding and bronchial hyper-reactivity to nonspecific stimuli-such as strong odors, cold air, pollutants and histamine.

The asthmatic children had more caries than controls, supporting various studies.[7-8] The large standard deviation indicated that the caries experience data was not evenly distributed, showing that some children had a lot of decay and some had very little. This may be partly explained by examining the practice group, those children taken from private hospitals, having a higher socioeconomic profile than the hospital group, i.e., those children taken from government hospitals. It is well documented that higher socioeconomic groups have better dental health than groups with lower socioeconomic –status[9] In addition, asthmatic children lead a restricted lifestyle, missing so much school not being able to play sports-and participate in formal activities; these children may frequently consume sweets, leading to increase in caries levels. Also, due to increased attention given to their genera! asthmatic condition, they may give little importance to oral hygiene procedures.1105 Drummond suggested that the association between asthma and dental caries is seen primarily in younger children and there is

no evidence of an association between asthma and dental caries in older children.

Factors related to chronic asthmatic condition and/or asthma medication might increase the risk of caries.[12] Patients with bronchial asthma are affected both by the disease and the drug. It is therefore difficult to dissociate the effects of the

two, but there are indications that the drug treatment exerts the stronger effect.[7] Various forms of medication play an important role. Conolly et al, suggested that the decrease in pH of saliva arid plaque in asthmatics was caused by the drug and not the disease.[13] Kargul et al,[4] stated that the low pH in asthmatics is due to the use of inhaler. A large proportion of inhaled drug is retained in oropharynx, ranging from 80% with a metered dose inhaler and 60% with a dry powder inhaler with extension tube. In addition, some dry powder inhalers contain sugar so that the patient can tolerate the taste of the drug when it is delivered. Frequent oral inhalation of sugar combined with a decrease in salivary flow rate and decrease in pH of saliva may contribute to increase in caries. Ryberg et al, suggested that the changes in saliva secretion and synthesis of salivary proteins are caused by the drug used for treatment.[5]

This study ever is that asthmatic patients using salbutamol inhaler had a significant increase in caries as compared to other groups, which was followed by salbutamol tablets. Ryberg et al, showed that the increase in caries is associated with use of p,

agonists, which leads to reduced salivary flow. The secretion rates of whole and parotid saliva is decreased by 26% and 36% respectively in asthmatic patients when compared with healthy control group. As reduced salivary flow is accompanied by concomitant increase in

Table 2: Intercomparison of CP1TN scores between the control group, beclamethasone inhaler group, salbutamol inhaler group and salbutamol tablet group

Groups	No. of cases	0(%)	CPITN	
Controls	(n = 106)	0 {%)	1(%)	2 (%)
Beclamethasone	(n = 35)	77(72.6)	28 (26.4)	1 (1.0)
inhaler	(n = 35)	22 (62.9)	10(28.6)	3 (8.5)
Salbutamol inhaler	(n = 35)	17(48.6) 24	12(34.3)	6(17.1)
Salbutamol tablets		(68.6)	7 (20.0)	4(11.4)

X^2 = 16.17; P<0.05, S

lactobacilli and streptococcus mutans in the oral cavity, it may be one of the major contributing factors for increase in caries rate. Intake of medication at. night before retiring to bed is commonly seen due to poor patient awareness and also no oral hygiene measures were usually taken after medication. Diminution of salivation and lack of masticatory movements during the night might have further increased the cariogenic potential of medicines.

The increase in caries prevalence with the severity of asthma may be mainly due to the increase in the dosage and frequency of medication, The lower outputs of saliva in the asthmatic group are not only explained by secretion of a smaller volume of saliva alone but also by changes in the composition of saliva. A low output also reflects a lower rate of biosynthesis of biologically active substances, which over a long period of time may increase dental caries activity. Availability of biologically active components is a decisive factor. The output of the antibacterial components was lower in the asthma patients. This should favor both bacterial colonization and plaque growth.[6]

Conclusion, asthmatic patients using beclamethasone inhaler showed an increase in dental caries, which was not statistically significant as compared to other groups inhaled beclamethasone compromises the oral immunity and interferes with the

inflammatory components as it acts as an anti-inflammatory agent.[8] Inhaled beclamethasone is known to cause oropharyngeal candidiasis and there might be alterations in the composition of plaque. [11]

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