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Mini Review

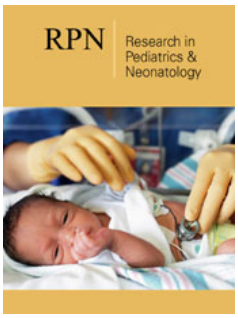
Dental Caries in Children With Asthma: A Mini-Review

Brandão Heli Vieira[1]* and Moura Millena Vieira Brandão[2]

[1]Departament of Health, State University of Feira de Santana, Brazil

[2]Resident doctor at the Clinical Hospital, University of São Paulo, Brazil

ISSN: 2576-9200



***Corresponding author:** Brandão Heli Vieira, Department of Health, State University of Feira de Santana, Brazil

Submission: October 10, 2021

Published: December 01, 2021

Volume 6 - Issue 2

How to cite this article: Brandão Heli Vieira, Moura Millena Vieira Brandão. Dental Caries in Children With Asthma: A Mini-Review. Res Pediatr Neonatol. 6(2). RPN. 000632. 2021.
DOI: 10.31031/RPN.2021.06.000632

Abstract

The purpose of this paper was to review the studies on association between dental caries and asthma in children. It evaluated the prevalence of dental caries and mechanisms involved including the use of inhaled drugs, bronchodilators and corticosteroids as a risk factor of dental caries in asthma children. The prevalence of dental caries is higher in asthmatic children and asthma may be a risk factor for the development of dental caries.

Keywords: Asthma; Anti-Asthmatics drugs; Dental caries

Introduction

Dental caries and asthma are relevant chronic diseases in Brazil and in the world. Asthma is a chronic inflammatory respiratory disease that affects 300 million people worldwide and its prevalence is increasing mainly among children [1]. Asthma control is based on medications for continuous use, in addition to avoiding exposure to aeroallergens. Asthma control programs in public health guarantee the population's access to inhaled medications for control of asthma [2,3]. Asthma treatment controls symptoms and reduces their severity. A stepwise approach is used with regular low-dose Inhaled Corticosteroids (ICS) administered to reduce the frequency and severity of asthma symptoms [1]. In the exacerbation of symptoms of asthma short or long-acting β_2 agonists (SABA or LABA, respectively) and anticholinergics are administered in combination with ICS and can contribute to the development of caries [4].

Dental caries is the most prevalent oral disease in children. It has multifactorial characters and microbial etiology. It is also strongly influenced by carbohydrates in the diet and by the action of salivary components [5]. Asthma and/or its medication may be responsible for higher prevalence of caries in children with asthma [6]. The aim of the present study was to assess the association between dental caries in asthmatic children treated with inhaled drugs.

Prevalence of Dental Caries in Children With Asthma

The increase of dental caries in children with asthma could be attributed to factors related to asthma itself and to effects from inhaled medications used in its treatment.

Results of a study by Wu FY et al. [4] indicated that children in treatment for asthma with inhaled medications had higher dental caries prevalence [4] and Samec T et al. [7] related higher rate of severe caries in children with asthma than in children without asthma. Reddy DK et al. [8] reported also that the increase in asthma severity is related to greater risk of dental caries. Study by Chellaih et al. [9] demonstrated an increased prevalence of dental caries with use of β_2 agonist and corticosteroid inhaled drugs at treatment of asthma and concluded that asthmatic children had a higher prevalence of dental caries when compared to healthy children. Vázquez EM et al. [10] reported that asthma had no effect on dental caries in asthmatic children in Mexico, except those with nocturnal asthma symptoms, that could be

linked to caries in primary dentition. The study of Ferrazzano GF et al. [11] examined the oral health status of children in southern Italy with mild intermittent and mild persistent asthma compared to healthy children and concluded that it was not a risk factor for asthma.

Alavaikko S et al. [12] conducted a meta-analysis with studies in children and adolescents and concluded that asthma doubled the risk of caries in both primary and permanent dentitions. Recently meta-analysis by Elyassi Gorji N et al. [13] showed that the prevalence of dental caries was higher among patients with asthma than in the control group. The DMFT (Decay-missing-filled teeth index) in patients with asthma were respectively 0.29 and 0.48 more than the control group. The conclusion is that, although the difference was not statistically significant, it was clinically significant and asthma may be considered a risk factor for the development of dental caries [13].

Genesis of Dental Caries in Children With Asthma

Dental caries in asthmatic children may have different biological mechanisms involved, from defects at formation of enamel and modification in saliva components to indirectly through the effect of medications used [13,14]. Guergolette RP et al. [14] estimated the risk of dental enamel defects in permanent dentition of 11 times with greater risk in patients with moderate/severe asthma, especially in those who presented symptoms before 3 years of age.

People with asthma may have reduced oxygen supply for active ameloblasts. Therefore, enamel formation may be compromised, occurring enamel defects and no repair of ameloblastic cells after the injury [15]. Consequently, respiratory diseases in first years of life can affect tooth formation and contribute to development of hypomineralized enamel lesion, which increases the risk of caries [14,15]. The use of antiasthmatic inhaled drugs (β_2-agonists plus corticosteroids) has cariogenic effects, such as negative effect on salivary production rate, a relatively low pH and may contain sweeteners such as lactose monohydrate in its composition. The use of these inhalers in combination with reduced salivary flow rate not only favors the formation of dental caries, but also the appearance of erosive lesions [16,17]. β_2- agonists also decrease total protein concentrations and amylase in saliva and increase concentration *Streptococcus Mutans* (SM) in children with asthma [16,18,19].

Conclusion

The prevalence of dental caries is higher among children with asthma and drugs used to treatment of asthma can increase caries severity. Oral hygiene measures should be intensified in asthmatic children, especially after the use of asthma control medications.

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