

Journal of Current Trends in Nursing & Health Care

Relationship Between Asthma and Childhood Obesity

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Received Date: 16 June, 2021

Accepted Date: 05 July, 2021

Published Date: 26 July, 2021

Citation: Lina Marcela Ortiz Roncallo, Javier eduardo mangones lopez, María camila Oliveros riveros, Tania Isabel Canabal vides, Oscar Luis Durango Conde, et al (2021) Relationship Between Asthma and Childhood Obesity. J Cur Tre Nur Health Care 2(2): 1-2

Abstract

Background: Asthma and obesity are two of the most prevalent health problems in childhood today. In recent years, numerous studies have linked both diseases, finding that excess weight favors the development of asthma in children.

Methodology: A narrative review was carried out through various databases from January 2018 to January 2021; the search and selection of articles was carried out in journals indexed in English. The following keywords were used: obesity, asthma, children, Pediatrics.

Results: Current evidence suggests that the effects of obesity on asthma, both in incidence and severity, are mediated by an inflammatory and cardiometabolic pathway. Adipokines secreted by adipose tissue exert significant effects not only on metabolism but also on the immune system and, although detailed mechanisms of their contribution still need to be established, they appear to represent important mediators in obesity-associated asthma.

Conclusions: This review offers recommendations for evaluating the relationship between asthma and obesity in pediatric patients and thus not underdiagnosing this presentation.

Keywords: Obesity, Asthma, Children, Pediatrics

Introduction

Obesity is a chronic and multifactorial disease, characterized by the accumulation of excess fat to a degree that causes alterations to health. Lifestyle changes, mainly bad eating habits and sedentary lifestyle, are currently pointed out as the main causes of obesity [1]. The incidence of childhood obesity has shown a great increase during the last decades. Children are eating more fats and sugars, eating less fruits and vegetables, and leading less active lives than before, all of these situations have a direct impact on children's growth and development. Our beliefs about food and health also

contribute to children's weight gain [2].

The increase in childhood obesity is accompanied by complications that imply future risks in health and quality of life both in childhood and in adulthood, however, weight problems begin at an earlier age so that women Health complications do as well and is associated with a higher likelihood of premature death and disability in adulthood. In addition to these future risks, obese children suffer from respiratory diseases such as asthma, increased risk of fractures and hypertension, and have early markers of

cardiovascular disease, insulin resistance, and psychological effects [3,4].

Materials and Methods

A narrative review was carried out, in which the PubMed, Scielo and ScienceDirect databases, among others, were searched. The collection and selection of articles was carried out in journals indexed in English from 2018 to 2021. As keywords, the following terms were used in the databases according to the DeCS and MeSH methodology: obesity, asthma, children, Pediatrics. In this review, 30 original and review publications related to the subject studied were identified, of which 10 articles met the specified inclusion requirements, such as articles that were in a range not less than the year 2018, which were articles of full text and to report on the relationship between asthma and obesity, as exclusion criteria, it was taken into account that the articles did not have sufficient information and that they did not present the full text at the time of their review.

Results

Asthma and obesity are two of the most prevalent health problems in childhood today. In recent years, numerous studies have linked both diseases, finding that excess weight favors the development of asthma in children [5]. Asthmatic disease is a chronic disease of worldwide distribution that mainly attacks children, it is a serious inflammatory process of the airways involving various mast cells, eosinophils, neutrophils, T lymphocytes, macrophages, and epithelial cells causing repetitive bouts of nighttime coughing, wheezing, shortness of breath, and chest tightness. These are the symptoms that are associated with a long and variable bronchial obstruction [6].

Asthma associated with childhood obesity is characterized by the presence of neutrophilic airway inflammation. The increase in adipose tissue function in obese subjects leads to a systemic pro-inflammatory state in which the serum concentrations of cytokines, soluble fractions of their receptors and chemokines are increased. Overweight or obese asthmatics have more severe exacerbations requiring hospital admission compared to asthmatics with a normal or low body mass index [7].

In relation to cardiometabolic factors and asthma, in prepubertal children it has been shown that insulin resistance and hyperglycemia are more closely associated with airway hyperresponsiveness than with obesity itself. Metabolic dysregulation, defined by insulin resistance and dyslipidemia, worsens lung function and promotes bronchial hyperresponsiveness, independent of BMI [8].

Current evidence suggests that the effects of obesity on asthma, both in incidence and severity, are mediated by an inflammatory and cardiometabolic pathway. Adipokines secreted by adipose tissue exert significant effects not only on metabolism but also on the immune system and, although detailed mechanisms of their contribution still need to be established, they appear to represent important mediators in obesity-associated asthma. The metabolic health of adipose tissue seems more important than the fat mass itself; in fact, the negative effect of trunk adiposity in the obese asthmatic patient, rather than due to a mechanical effect, is due to the inflammation associated with central obesity [9,10].

Discussion

Gold et al., In 9828 children between 6 and 14 years of age with a follow-up for five years, reported a 2.2 times greater risk for asthma, especially in girls, with excess weight.

The ISAAC study (International Study of Asthma and Allergies in Childhood) 16 also reinforces the evidence that excess weight is associated with wheezing and asthma in childhood.

In the meta-analysis by Flaherman and Rutherford, where 12 studies were analyzed, 50 found that in four of them there was a 4 times higher risk for asthma in schoolchildren with obesity. We can conclude that current behaviors such as hypercaloric diets and the decrease in physical activity in children, favors the development of childhood obesity and asthma. It is very important to promote healthy lifestyles, since weight reduction shows us an improvement in symptoms, lung function and control of the disease at an early age.

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