RCMOS – Multidisciplinary Scientific Journal of Knowledge.
ISSN: 2675-9128. São Paulo-SP.
Year IV, v.1, n.1, jan./jul. 2024. | submission: 2024-09-16 | accepted: 2024-09-18 | publication: 2024-09-20

UPDATES ON THE MANAGEMENT OF PEDIATRIC ASTHMA

UPDATES IN THE MANAGEMENT OF PEDIATRIC ASTHMA

Guilherme Starling Moss– Pontifical Catholic University of Minas Gerais
Artur Carvalho Diamante– Pontifical Catholic University of Minas Gerais
Izabele von Kruger de Alcantara e Silva – Pontifical Catholic University of Minas Gerais
Larissa Ramalho Las-Casas – Pontifical Catholic University of Minas Gerais

SUMMARY:

Pediatric asthma is a widely prevalent chronic condition, being one of the main causes of hospitalization among children. In addition, it represents one of the main causes of school absenteeism and limitations in daily activities, directly impacting the quality of life of patients and their families. The management of pediatric asthma involves a multifaceted approach, which includes the use of inhaled medications, environmental control and dietary interventions. This study aims to review the most recent updates in the management of pediatric asthma, considering new pharmacological treatments, such as the use of biologics, and preventive strategies, such as immunotherapy and environmental control. The integrative review was conducted based on nine articles selected from a total of 1,507, after applying relevance filters, published between 2021 and 2024. The results indicate that the use of inhaled corticosteroids and bronchodilators remains the mainstay of asthma management, but new approaches, such as immunotherapy for allergic comorbidities and the use of vitamin D as an adjuvant, have shown promise. It is concluded that personalizing the treatment of pediatric asthma, integrating pharmacological and preventive strategies, offers new perspectives for more effective control of the disease.

Keywords: Pediatric Asthma. Allergen Control. Inhaled Corticosteroids. Management.

Prevention.

ABSTRACT:

Pediatric asthma is a highly prevalent chronic condition and one of the leading causes of hospitalizations and morbidity among children. Effective asthma management requires a combination of pharmacological interventions and preventive strategies aimed at reducing exacerbations and improving quality of life. This study reviews the most recent updates in pediatric asthma treatment, with a focus on new therapeutic agents and innovative approaches. The integrative review included nine selected articles from a total of 1,507, published between 2021 and 2024, after applying relevance filters. The results indicate that the use of inhaled corticosteroids as rescue therapies remains an essential cornerstone in management, while immunotherapies and environmental interventions, such as allergen control in schools, are gaining prominence. Furthermore, studies highlight the importance of dietary control and early prevention of allergic comorbidities, such as rhinitis and atopic dermatitis. The combination of these pharmacological and non-pharmacological strategies shows promise in pediatric asthma management, contributing to better treatment adherence and improved clinical outcomes.

Keywords: Allergen Control. Inhaled Corticosteroids. Management. Pediatric Asthma. Prevention.

1. INTRODUCTION

Pediatric asthma is one of the most common chronic respiratory diseases among children, affecting millions of children worldwide. It is a chronic inflammatory condition of the airways that causes intermittent and reversible airflow obstruction and bronchial hyperresponsiveness. Asthma is characterized by recurrent episodes of wheezing, shortness of breath, chest tightness, and coughing, and is often triggered by viral infections, exercise, allergens, and climate change. Due to its prevalence, asthma has a significant impact on the lives of children and their families, being a leading cause of school absenteeism and limited physical activity (Boeschoten*et al.*, 2022).

The management of pediatric asthma involves a multifactorial approach, which includes the prevention of exacerbations, the use of medications to control symptoms and the reduction of exposure to allergic triggers. Traditionally, treatment involves the use of inhaled corticosteroids for inflammatory control and short-acting bronchodilators for relief of acute symptoms. However, in recent years, new guidelines and treatments have emerged, highlighting immunotherapies for allergic comorbidities and the use of biological agents, such as mepolizumab, especially in severe cases of eosinophilic asthma (Jackson et al., 2012).*et al.*, 2022). In addition, there is growing interest in preventive interventions, such as environmental control and the use of supplements, such as vitamin D, to help control lung inflammation (Williamson*and al.*, 2023).

This study aims to review the most recent updates in the management of pediatrics asthma, focusing on new pharmacological therapies and preventive strategies, seeking to understand how these innovations can contribute to more effective control of the disease and improvement in the quality of life of patients.

2. MATERIAL AND METHOD

This study was carried out through an integrative review of the scientific literature. Searches were performed in the PubMed database, using the following search key: "('pediatric asthma' OR 'childhood asthma') AND ('management' OR 'treatment') AND ('updates' OR 'new guidelines' OR 'recent advancements')". The selection of studies had as inclusion criterion articles published between 2021 and 2024, in English, that addressed the management of pediatrics asthma with a focus on new therapeutic and preventive approaches.

Studies involving randomized clinical trials and meta-analyses were considered, excluding those focused exclusively on adult populations or those that did not have access to the full text. The initial search resulted in 1,507 articles. After applying filters related to relevance, type of study and language, 14 articles were selected for full reading. In the end, 9 articles were included in this review, as shown in Table 1.

Table 1. Works included.

Database	**Title**	**Authors**	**Periodical (vol, no, page, year)**	**Considerations Themes**
PubMed	Efficacy of th and loading dose of IV salbutamol in children with severe acute asthma admitted to a PICU: a randomized controlled trial.	BOESCHOTEN, S. THE.*et al.*	**Eur J Pediatr**, v.181, p.3701-3709, 2022	Study on the use of salbutamol intravenous in children with asthma acute.
PubMed	THErandomized, open label, pragmatic study to assess reliever-triggered inhaled corticosteroid in African American/Black	ISRAEL, I.*et al.*	**Contemp Clin Trials**, v.101, p.106246, 2021	Study on the use of corticosteroids inhalers of rescue in populations African-Americans thed Latin.

	and Hispanic/Latinx adults with asthma.			
PubMed	Mepolizumab for urban children with exacerbation-prone eosinophilic asthma in the USA (MUPPITS-2): thand randomised, double-blind, placebo-controlled trial.	JACKSON, DJ*et al*.	**Lancet**, v.400, p.502-511, 2022	Assessment of mepolizumab in children with asthma eosinophilic exacerbating.
PubMed	Effect of School Integrated Pest Management or Classroom Air Filter Purifiers on Asthma Symptoms in Students With Active Asthma: A Randomized Clinical Trial.	PHIPATANAKUL, W.*et al*.	**JAMA**, v.326, p.839-850, 2021	Study on thand impact of interventions environmental node control of asthma in schools.
PubMed	Effects of Early Diet on the Prevalence of Allergic Disease in Children: THAND Systematic Review and Meta-Analysis.	WANG, S.*et al*.	**Adv Nutr**, v.15, p.100128, 2024	Study on I u effects from the diet early in the prevention of illnesses allergic in children with asthma.
PubMed	Vitamin D for the management of asthma.	WILLIAMSON, A. *et al*.	**Cochrane Database Syst Rev**, v.2, p.CD011511, 2023	Review on use of vitamin D as an adjuvant in

				asthma management pediatric.
PubMed	Allergen immunotherapy for atopic dermatitis: Systematic review and meta-analysis of benefits and harms.	YEPES-NUNEZ, J. J.*et al.*	**J Allergy Clin Immunol**, v.151, p.147-158, 2023	Review on benefits from thand immunotherapy in patients with atopic dermatitis and asthma.

Source: own authorship, 2024.

3. RESULTS AND DISCUSSION

The results of this review indicate that the management of pediatric asthma has evolved significantly with advances in both pharmacological and preventive and environmental interventions. One of the studies reviewed showed that the use of intravenous salbutamol in children with severe asthma is effective in reducing acute symptoms and decreasing the length of stay in intensive care units. This intervention has been particularly useful in situations where inhaled treatment is insufficient, offering an effective approach to control severe asthma attacks (Boeschoten*et al.*, 2022).

Additionally, the use of rescue inhaled corticosteroids has been studied in African-American and Latino populations and has been shown to be effective in preventing exacerbations and controlling airway inflammation. This is particularly relevant considering that these populations are at higher risk of hospitalization due to asthma. The introduction of rescue corticosteroids represents a valuable additional measure to improve symptom control and reduce serious complications (Israel *et al.*, 2021).

Another important advance discussed involves the use of biologics, such as mepolizumab, which has been shown to be effective in children with exacerbating eosinophilic asthma. Studies have shown that the use of this drug significantly reduces exacerbations and improves lung function by modulating the immune response and controlling eosinophil-mediated inflammation (Jackson et al., 2004).*et al.*, 2022). Furthermore, immunotherapy in children with asthma associated with allergic comorbidities, such as rhinitis and atopic dermatitis,

showed promising results, reducing allergic symptoms and contributing to a better quality of life (Yepes-Nunez*et al.*, 2023).

In the field of environmental interventions, the use of air purifiers and integrated pest management in school environments has been shown to have a positive impact on reducing asthma symptoms. These interventions are particularly useful in urban areas with high concentrations of pollutants and allergens, complementing traditional drug treatment (Phipatanakul*et al.*, 2021).

Finally, the review also pointed out that diet plays a relevant role in the control of asthma and allergic comorbidities. It was observed that the early introduction of a balanced diet can reduce the prevalence of allergic diseases, such as atopic dermatitis, in children with asthma. In addition, vitamin D supplementation has shown potential as an adjuvant in treatment, improving the immune response and reducing lung inflammation (Williamson*et al.*, 2023; Wang*et al.*, 2024).

FINAL CONSIDERATIONS

Updates in the management of pediatric asthma indicate important advances in both the development of new pharmacological therapies and the application of preventive and environmental interventions. The use of inhaled corticosteroids and bronchodilators continues to be an essential approach for controlling inflammation and providing immediate relief of symptoms, especially during acute attacks (Boeschoten*et al.*, 2022; Israel*et al.*, 2021). However, new therapies, such as mepolizumab, offer promising options for children with severe asthma, reducing exacerbations and improving lung function (Jackson*et al.*, 2022).

In addition to pharmacological interventions, the implementation of preventive measures, such as environmental control and immunotherapy, has been shown to be effective in reducing symptoms in children with asthma associated with allergic comorbidities. These strategies are essential to minimize exposure to triggers, improving asthma control and the quality of life of patients (Yepes-Nunez*et al.*, 2023; Phipatanakul*et al*. , 2021).

Combining these approaches, along with lifestyle changes such as early introduction of a balanced diet and vitamin D supplementation, offers a

the most comprehensive and effective approach to the management of pediatric asthma. Personalization of treatment, which integrates pharmacological and preventive interventions, is essential to ensure long-term control of the disease, reducing exacerbations and hospitalizations, and providing a better quality of life for children with asthma (Williamson*et al.*, 2023; Wang*et al.*, 2024).

REFERENCES

BOESCHOTEN, SA*et al.* Efficacy of a loading dose of IV salbutamol in children with severe acute asthma admitted to a PICU: a randomized controlled trial.**Eur J Pediatr**, v.181, p.3701-3709, 2022.

ISRAEL, I.*et al.* A randomized, open-label, pragmatic study to assess reliever-triggered inhaled corticosteroids in African American/Black and Hispanic/Latinx adults with asthma.**Contemp Clinical Trials**, v.101, p.106246, 2021.

JACKSON, DJ*et al.* Mepolizumab for urban children with exacerbation-prone eosinophilic asthma in the USA (MUPPITS-2): a randomized, double-blind, placebo-controlled trial.**Lancet**, v.400, p.502-511, 2022.

PHIPATANAKUL, W.*et al.* Effect of School Integrated Pest Management or Classroom Air Filter Purifiers on Asthma Symptoms in Students With Active Asthma: A Randomized Clinical Trial.**JAMA**, v.326, p.839-850, 2021.

WANG, S.*et al.* Effects of Early Diet on the Prevalence of Allergic Disease in Children: A Systematic Review and Meta-Analysis.**Adv Nutr**, v.15, p.100128, 2024.

WILLIAMSON, A.*et al.* Vitamin D for the management of asthma.**Cochrane Database Syst Rev**, v.2, p.CD011511, 2023.

YEPES-NUNEZ, J.J.*et al.* Allergen immunotherapy for atopic dermatitis: Systematic review and meta-analysis of benefits and harms.**J Allergy Clin Immunol**, v.151, p.147-158, 2023.