

## ALLERGIC CONJUNCTIVITIS IN CHILDHOOD

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**Abstract:** Allergic conjunctivitis is an eye condition prevalent among children, characterized by inflammation of the conjunctiva resulting from an allergic reaction to substances such as pollen, dust, dust mites and animal dander. This disease is a manifestation of the immune system and causes symptoms such as intense itching, tearing, hyperemia and a sensation of a foreign body in the eyes. The management of allergic conjunctivitis ranges from simple measures, such as frequent eye washing and avoidance of allergens, to the use of medications such as antihistamines, mast cell stabilizers and topical corticosteroids. In childhood, the management of allergic conjunctivitis faces difficulties such as variability in response to treatment and the impossibility of completely avoiding exposure to allergens. The general objective of this study is to evaluate management strategies for allergic conjunctivitis in childhood, with an emphasis on the effectiveness of available treatments and the identification of factors that influence the response to treatment. Specific objectives include analyzing the effectiveness of different treatments, investigating the influence of environmental and individual factors on disease severity and recurrence, and discussing the management of allergic conjunctivitis. This study is relevant as appropriate management of allergic conjunctivitis can prevent complications and improve children's well-being. Identifying factors that influence response to treatment can contribute to the development of more personalized and effective therapeutic approaches. Recent literature highlights the need to improve education of parents and caregivers about allergic conjunctivitis to ensure appropriate management of the disease. Studies show that understanding the immunological mechanisms underlying the disease

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is crucial for developing new therapies. Therefore, this research not only adds to scientific knowledge about childhood allergic conjunctivitis, but also provides valuable insights for clinical practice and health policy formulation.

**Keywords:** allergic conjunctivitis, children, inflammation, allergens.

## INTRODUCTION

Allergic conjunctivitis is a common eye condition that affects children around the world, characterized by an inflammation of the conjunctiva caused by an allergic reaction to substances such as pollen, dust, mites and animals (Santos, 2018). This eye disease is a manifestation of the immune system in response to allergens and can cause symptoms such as intense itching, tearing, hyperemia and foreign body sensation (OLIVEIRA; SILVA, 2020). The prevalence of allergic conjunctivitis has increased in recent decades, reflecting a global tendency for the growth of allergic diseases, possibly influenced by environmental factors and lifestyle changes (Cruz et al., 2017).

In childhood, allergic conjunctivitis is not only an eye health problem, but also a condition that can significantly affect children's quality of life. Uncomfortable symptoms may interfere with school performance, recreational activities and sleep, leading to a negative impact on the general development of the child (MORAIS; PEREIRA, 2019). In addition, the presence of other allergic conditions, such as rhinitis and asthma, may aggravate eye symptoms and complicate disease management (FERREIRA; CARVALHO, 2016). Therefore, understanding the factors that contribute to allergic conjunctivitis and the development of effective strategies for their management are essential to improving the quality of life of affected children.

Treatments for allergic conjunctivitis include from simple measures such as frequent eye washing and allergens preventing medications such as antihistamines, mast cell stabilizers and topical corticosteroids (Jones et al., 2015). Recently, advances in understanding the immunological



mechanisms underlying allergic conjunctivitis have enabled the development of new biological therapies, which aim to modulate the immune response more specifically and effectively (Smith; Brown, 2021). However, adherence to treatment and correct identification of triggering allergens remain important challenges in the management of the disease.

Despite the various treatment options available, the management of allergic conjunctivitis in childhood faces significant challenges, including variability in response to treatment and difficulty in completely avoiding exposure to allergens. In addition, lack of knowledge about the disease between parents and caregivers can lead to inappropriate management, resulting in frequent recurrences and additional complications. Given this scenario, the question is: How can we improve the management of allergic conjunctivitis in children, considering the diversity of environmental and individual factors that influence the disease?

The overall objective of this study is to evaluate the management strategies of allergic conjunctivitis in childhood, focusing on the effectiveness of available treatments and identifying factors that influence response to treatment.

Specific objectives:

1. Analyze the effectiveness of different treatments available for allergic conjunctivitis in children.
2. Investigate the influence of environmental and individual factors on the severity and recurrence of allergic conjunctivitis.
3. Discuss allergic conjunctivitis and disease management.

This study is of great relevance, as allergic conjunctivitis is a common condition that can significantly affect children's quality of life. As highlighted by Silva and Rodrigues (2019), proper management of allergic conjunctivitis can prevent complications and improve the well-being of affected children. In addition, identification of factors that influence response to treatment can contribute to the development of more personalized and effective therapeutic approaches.



Recent literature reinforces the importance of studies in this area. According to Oliveira et al. (2020), there is an urgent need to improve parents and caregivers' education on allergic conjunctivitis to ensure proper disease management. Studies such as Smith and Brown (2021) also point out that understanding the immunological mechanisms underlying the disease is crucial for the development of new therapies. Therefore, this research not only contributes to scientific knowledge about allergic conjunctivitis in childhood, but also provides valuable insights for clinical practice and the formulation of health policies.

## **Methodology**

This study adopted the narrative review methodology of literature, a qualitative method that seeks to compile, analyze and critically interpret the existing scientific production on a particular theme. In the case of allergic conjunctivitis in childhood, narrative review allowed the comprehensive and detailed view of the different aspects of this condition, including their prevalence, symptoms, risk factors, impact on children's quality of life and management strategies. The narrative review is especially useful for topics that cover a body of extensive and diverse literature, where the integration of different theoretical and empirical perspectives is necessary for a holistic understanding of the problem.

Research sources for this review included online databases widely recognized by the scientific community. Among these bases are Scielo (Scientific Electronic Library Online), which offers access to a vast collection of scientific journals in Latin America and the Caribbean, providing an essential regional perspective on allergic conjunctivitis; Lilacs (Latin American and Caribbean in Health Sciences), which is one of the most important databases in Latin America, offering a broad coverage of relevant articles published in scientific journals in the region; and Pubmed (National Library of Medicine), one of the largest and most comprehensive biomedical databases in the world, which includes millions of international scientific literature citations, covering clinical, epidemiological



and basic research aspects of allergic conjunctivitis. The inclusion of these databases ensured a comprehensive and diverse coverage of the available literature, allowing the incorporation of global and regional perspectives on the subject.

The selection process of studies followed strict criteria to ensure the relevance and quality of information included in the review. Initially, searches were performed using keywords such as “allergic conjunctivitis”, “childhood”, “prevalence”, “treatment” and “quality of life” in Portuguese and English. The articles were selected based on the relevance to the theme, date of publication (prioritizing the last ten years) and type of study (including systematic revisions, clinical trials, observational studies and expert opinion articles). After the initial identification of the articles, a screening of the summaries was performed to verify the adequacy to the scope of the review, followed by the full reading of the selected texts for the extraction and detailed analysis of the data. The adopted methodology allowed a robust and critical synthesis of existing literature on childhood allergic conjunctivitis, offering valuable insights for clinical practice and future research.

## **Development**

Childhood allergies represent a significant set of immunological conditions that affect a growing number of children worldwide. Characterized by exaggerated immunological responses to normally harmless substances, such as pollen, dust, food and animal hair, allergies can manifest in various ways, including rhinitis, asthma, atopic dermatitis and allergic conjunctivitis. The prevalence of these conditions has increased in recent decades, partly due to environmental factors and changes in life habits. Allergies not only cause physical discomfort, but also negatively impact children’s quality of life, affecting their school performance, recreational activities and emotional well-being. Understanding underlying immunological mechanisms and developing effective management strategies are essential for mitigating the adverse effects of these conditions on childhood.

Allergic conjunctivitis is one of the most common allergic manifestations in children,



characterized by the inflammation of the conjunctiva caused by an immune response to environmental allergens. This condition causes symptoms such as intense itching, tearing, redness and foreign body sensation, which can be extremely uncomfortable and affect children's quality of life. Early identification and proper management of allergic conjunctivitis are fundamental to prevent complications and improve the well-being of affected children. In addition to pharmacological treatments, which include antihistamines, mastocyte and corticosteroid stabilizers, parents and caregivers education about the disease and their preventive measures play a crucial role in symptom control and reduced allergens exposure. Thus in this chapter there is allergies in childhood and allergic conjunctivitis in childhood

## **Childhood allergies**

Childhood allergies are a group of immunological conditions that affect a significant portion of the pediatric population globally. Characterized by adverse reactions of the immune system to substances that are generally harmless, such as pollen, mites, foods and animals, these conditions can manifest in many ways, including asthma, allergic rhinitis, atopic dermatitis and allergic conjunctivitis. The prevalence of these conditions has increased substantially in recent decades, becoming an important concern for public health (SILVA et al., 2015). This chapter aims to address various aspects of allergies in childhood, including epidemiology, diagnosis, pathophysiology and symptoms, with special focus on therapeutic and management approaches.

The prevalence of allergies in childhood varies widely depending on the geographical region, socioeconomic factors and lifestyles. Recent studies indicate that about 20% to 30% of children in developed countries have some kind of allergic condition (SANTOS et al., 2018). In Brazil, for example, allergic rhinitis affects approximately 25% of children, while asthma prevalence is about 10% (Almeida et al., 2016). These numbers are worrying because childhood allergies are associated with a series of comorbidities that can significantly impact the quality of life of affected children and their families.



Several risk factors are associated with the development of childhood allergies. Among the most important are genetic predisposition, early exposure to allergens, environmental pollution and changes in eating habits (NUNES; LIMA, 2017). Children with family history of allergies have an increased risk of developing allergic conditions. In addition, urbanization and exposure to pollutants, such as cigarette smoke and industrial pollutants, have been implicated in the growing prevalence of allergic diseases in urban areas (MARTINS; OLIVEIRA, 2019).

The pathophysiology of allergies involves a complex immune response that is triggered by exposure to allergens. This response is mediated by immune system cells, such as Type 2 Type 2 (TH2) lymphocytes, which promote the production of immunoglobulin and (IgE) by B cells. IgE binds to mastocytes and basophils, resulting in the release of inflammatory mediators, like histamine, leukotrienes and prostaglandins, which cause allergic symptoms (Rodrigues et al., 2020). This inflammatory process can affect various parts of the body, including respiratory tract, skin and eyes.

Symptoms of childhood allergies may vary widely depending on the type of allergen and exposure pathway. Common symptoms include sneezing, runny nose, eye itching, urticaria, eczema and, in severe cases, anaphylaxis (Carvalho; Pereira, 2018). The diagnosis is usually based on clinical history and symptoms presented by the child. Laboratory tests, such as specific IgE dosage and hypersensitivity cutaneous tests, can be used to confirm the presence of sensitization to specific allergens (FERNANDES et al., 2017).

Respiratory allergies, including allergic rhinitis and asthma, are some of the most common manifestations of childhood allergies. Allergic rhinitis is characterized by symptoms such as sneezes, runny nose, nasal congestion, and eye itching, while asthma surrounds chronic airway inflammation, resulting in symptoms such as cough, wheezing and breathing difficulty (SOUZA et al., 2016). The coexistence of these conditions is common and can complicate the clinical management of affected children.

Atopic dermatitis, or eczema, is another frequent manifestation of childhood allergy, characterized by chronic skin inflammation that causes intense itching, rash and dry skin (GOMES;



MARTINS, 2017). This condition can have a significant impact on children's quality of life, interfering with sleep, school performance and daily activities. Atopic dermatitis is often associated with other allergic conditions, such as asthma and allergic rhinitis, in a phenomenon known as atopic march.

Allergic conjunctivitis is an inflammation of the ocular conjunctiva caused by an allergic reaction to allergens such as pollen, mites and hair. Symptoms include itching, tearing, redness and foreign body sensation (PEREIRA; SILVA, 2018). This condition may occur in isolation or in association with other allergies, such as allergic rhinitis. The diagnosis is based on clinical history and symptoms, and can be confirmed by specific allergic tests.

The differential diagnosis of childhood allergies is crucial to differentiate these conditions from other diseases that may have similar symptoms. For example, viral and bacterial respiratory infections may cause symptoms similar to those of allergic rhinitis, while skin diseases such as psoriasis and seborrheic dermatitis, may mimic atopic dermatitis (COSTA; ALMEIDA, 2019). Laboratory tests and detailed clinical history are essential to establish a precise diagnosis and guide proper treatment.

The management of childhood allergies involves a combination of pharmacological prevention and treatment measures. Prevention includes the identification and avoidance of known allergens, which can be challenging in urban environments where exposure to pollutants is inevitable (ALMEIDA et al., 2016). Pharmacological treatment includes the use of antihistamines, corticosteroids, bronchodilators and specific immunotherapy, depending on the type and severity of allergy (SANTOS et al., 2018).

Antihistamines are often used as the first line of treatment for mild to moderate allergies. They block histamine receptors, reducing the symptoms of itching, sneezing and runny nose. Second-generation antihistamines, such as loratadine and cetirizine, are preferred due to their safety profile and lower sedative side effects (MARTINS; OLIVEIRA, 2019). Corticosteroids are effective in treating serious inflammation associated with allergies. They can be administered topically, inhaled or systemically, depending on the location and severity of symptoms. Although highly effective, their prolonged use should be monitored due to the risk of adverse effects, such as adrenal suppression and





osteoporosis (GOMES; MARTINS, 2017).

Specific immunotherapy, also known as desensitization, is a treatment that aims to modify the immune response to the allergen, providing long-term relief from allergic symptoms. This treatment involves the administration of increasing doses of the allergen in question, either subcutaneous or sublingual over a period of time (RODRIGUES et al., 2020). Immunotherapy has shown to be effective for respiratory allergies and insect bites, with benefits that can last years after the end of treatment.

Several barriers can make it difficult for effective treatment of childhood allergies, including limited access to specialized care, lack of knowledge about disease and economic difficulties. Interventions directed to overcome these barriers, such as public health policies and support programs, can significantly improve the clinical results and quality of life of allergic children (COSTA; ALMEIDA, 2019).

Continuous research on the pathophysiology of allergies and the development of new therapies promise significant advances in the management of these conditions. New biological treatments, which aim at specific components of immune response, are under development and can offer more effective and safe options for children with severe allergies (PEREIRA; SILVA, 2018). In addition, the implementation of public health policies focused on prevention and early management of childhood allergies is essential to reduce the impact of these conditions on society.

Childhood allergies represent a significant challenge for children, parents and health professionals. The comprehensive understanding of risk factors, pathophysiology and symptoms is crucial for precise diagnosis and effective management. The multidisciplinary approach, which includes education, prevention and personalized treatment, is critical to improving the quality of life of allergic children. Continuous advances in research and clinical practice offer hope for a future where childhood allergies can be more effectively controlled, allowing all children to live a healthy life and without limitations imposed by these chronic conditions.



## **Allergic conjunctivitis in childhood**

Childhood allergies represent a group of immunological conditions that occur in response to environmental, food or contact allergens, and have become a growing concern in global public health (SILVA; RODRIGUES, 2019). Among the various allergic manifestations, allergic conjunctivitis stands out for its high prevalence and impact on the quality of life of children. This condition is characterized by an inflammation of the conjunctiva, the membrane that covers the surface of the eye and the inside of the eyelids, and is triggered by an exaggerated immune response to substances such as pollen, dust, mites and animal hair (Ferreira; Carvalho, 2016).

The prevalence of allergic conjunctivitis in childhood has increased significantly in recent decades, following the overall tendency of increased allergic diseases (Cruz et al., 2017). Epidemiological studies indicate that up to 40% of school-age children may have symptoms of allergic conjunctivitis at some point in their lives (Smith; Brown, 2021). This elevation in prevalence can be attributed to several factors, including urbanization, environmental pollution, lifestyle changes and changes in allergens from early childhood (OLIVEIRA; SILVA, 2020).

The immune response in allergic conjunctivitis involves a complex interaction between immunological cells and inflammatory mediators. Exposure to allergens leads to activation of Type 2 (Th2) cells, which in turn promote IgE production by B cells. The connection of IgE to mastocytes results in the release of histamine and other inflammatory mediators, causing them Classic symptoms of allergic conjunctivitis such as itching, tearing, hyperemia and conjunctival edema (MORAIS; PEREIRA, 2019).

Symptoms of allergic conjunctivitis may vary from light to severe and include intense itching, excessive tearing, ocular redness and foreign body sensation (FERREIRA; CARVALHO, 2016). The diagnosis is usually clinical, based on medical history and symptoms presented by the child. However, allergic tests, such as specific IgE dosage and hypersensitivity skin tests, may be useful for identifying the triggering allergens and confirming the diagnosis (SANTOS, 2018).



Allergic conjunctivitis can significantly affect children's quality of life, interfering with daily activities such as school performance, sports and games, as well as causing physical and emotional discomfort (Smith; Brown, 2021). The co-occurrence of other allergic conditions, such as rhinitis and asthma, may aggravate symptoms and complicate disease management (FERREIRA; CARVALHO, 2016).

Treatment of allergic conjunctivitis includes non-pharmacological and pharmacological measures. Non-pharmacological measures involve reducing exposure to allergens, such as maintaining dust and mites free environments and the use of air filters. Pharmacological options include topical and oral antihistamines, mastocytic stabilizers, topical corticosteroids and immunomodulators (Jones et al., 2015). The choice of treatment should be individualized, considering the severity of symptoms and response to the previous treatment (OLIVEIRA; SILVA, 2020).

Antihistamines are often the first line of treatment for allergic conjunctivitis, rapidly acting on the reduction of ocular itching and redness. These medications block histamine receptors, reducing the inflammatory response (MORAIS; PEREIRA, 2019). Topical antihistamines such as olopatadine and ketotifene have been widely used due to their effectiveness and safety profile (Smith; Brown, 2021).

Mastocyt stabilizers, such as sodium chromoglycate and lodoxamide, prevent mastocyte degranulation and the release of inflammatory mediators. These medications are effective in preventing the symptoms of allergic conjunctivitis, but their effect may take a few weeks to manifest, being more suitable for prophylactic use (Jones et al., 2015).

Topical corticosteroids, such as dexamethasone and lotprednol, are used in cases of severe or refractory allergic conjunctivitis to conventional treatments. Although effective in reducing inflammation, its use should be cautious due to potential adverse effects, such as increased intraocular pressure and risk of eye infections (Smith; Brown, 2021).

Immunomodulators, such as cyclosporine and tacrolimus, have emerged as therapeutic options for allergic conjunctivitis, especially in severe or chronic cases. These drugs modulate the



immune response, reducing inflammation and associated symptoms (OLIVEIRA; SILVA, 2020). Recent studies have shown the effectiveness of these agents in disease control, with an acceptable safety profile (MORAIS; PEREIRA, 2019).

The education of parents and caregivers is a crucial component in the management of allergic conjunctivitis in childhood. Information about the nature of the disease, triggering factors and preventive measures can help improve symptom control and treatment adherence (SANTOS, 2018). Educational programs and informative materials have shown to be effective in reducing the exacerbations of the disease and improving the quality of life of children (FERREIRA; CARVALHO, 2016).

Several barriers can make it difficult to treat allergic conjunctivitis, including lack of knowledge about the disease, difficulties in access to specialized care and inadequate adherence to the therapeutic regime. Studies suggest that interventions aimed at overcoming these barriers, such as awareness campaigns and support programs, can significantly improve clinical results (Cruz et al., 2017).

Continuous research on the pathophysiology of allergic conjunctivitis and the development of new biological therapies promise significant advances in disease management. Directed therapies, which specifically modulate components of immune response, are under development and can offer more effective and safe options for children with allergic conjunctivitis (Smith; Brown, 2021).

Allergic conjunctivitis in childhood is a prevalent condition that requires a multifaceted approach to its effective management. Understanding immunological mechanisms, early identification of allergens, and proper use of available therapies is fundamental to symptom control and improving the quality of life of affected children. In addition, the education of parents and caregivers and overcoming barriers to treatment are essential components of a comprehensive strategy of disease management.



## **Environmental factors and treatments available for allergic conjunctivitis**

Ocular allergy is one of the most common conditions in daily ophthalmological practice. Inflammation of the allergic etiology conjunctiva rarely occurs in isolation and usually occurs together with the involvement of ocular annexial structures, such as corneal and eyelids, which is why it is often referred to as “allergic eye disease”.

Allergic conjunctivitis is a common eye condition that is significantly influenced by environmental factors. The incidence of allergic conjunctivitis has increased, which is partially attributed to the increase in environmental pollution levels. Pollinents such as pollen, dust and other air allergens are the main triggers of allergic conjunctivitis, causing symptoms such as itching, redness and tearing. Seasonal allergic conjunctivitis, the most prevalent type, is particularly influenced by seasonal variations at pollen levels, while perennial allergic conjunctivitis can be triggered by exposure throughout the year to allergens, such as either either animal hair (Castillo et al. 2015).

In the pathogenesis of this process, mastocytes are involved, which with their disagreement produce the massive release of histamine and other inflammatory substances, although eosinophils, lymphocytes and neutrophils also acquire great importance. Most ocular allergic processes are produced by a type I or IgE dependent mechanism, whose response is mediated by mastocytes. The late phase or type IV allergic response is one that occurs between 6 and 12 hours after contact with the allergen and depends on the activity of neutrophils and eosinophils. The final action of these cells enabled in the target organ consists of vasodilation, increased vascular permeability, leukocyte chemotaxis, tissue destruction and later, repair of the ocular surface (FERREIRA; CARVALHO, 2016).

From the semiological point of view, the fundamental symptom is itching, although redness, mosmosis or mucous secretion may also appear. Among therapeutic measures, it acquires great importance to the reduction of symptoms that afflict the patient, for which there is an important therapeutic arsenal ranging from the classic vasoconstrictants, antihistamines or corticosteroids to



recently introduced medicines, such as new stabilizers of the mast. Cell membrane or other therapeutic methods not yet fully developed or implemented, such as cyclosporine or plasmapheresis in certain cases (SILVA; RODRIGUES, 2019).

It is noteworthy the importance of topical pathway over systemic in the treatment of eye allergic diseases. However, the hygienic support measures that also reduce symptoms and reduce the risk of superinfections and complications should not be forgotten. These eye allergic diseases are classified below and their symptoms, diagnosis and treatment are explained (OLIVEIRA; SILVA, 2020).

The mechanism by which eye allergic disease occurs is still unknown. It was classically described as a type I immediate hypersensitivity reaction or IgE dependent. Today it is known that there are many other immunological mechanisms involved, because although mastocyte degranulation, eosinophilic infiltration and family history of atopy are found in many ocular allergic diseases, in other cases there is no such antecedents, high IgE values or absence of Response to antihistamines and membrane stabilizers. In addition, contact dermatitis represents a classic example of type IV or delayed reaction (Dudeja et al., 2019, Dara et al., 2022).

The late phase allergic response (which occurs between 6 and 12 hours after contact with the allergen) depends on the activity of neutrophils and eosinophils. The latter release basic proteins and peroxidases, among other cytotoxins responsible for tissue damage in allergic conditions. They also feed on the process as they promote the disagreement of mastocytes, releasing more inflammatory agents. The final action of all these target organized cells consists of vasodilation, increased vascular permeability, leukocyte chemotaxis, tissue destruction and subsequent repair of ocular surface tissues (CHIGBU; COYNE, 2015, Cruz et al., 2017).

Most eye allergic processes are produced by a type I hypersensitivity mechanism. When the antigen to which the patient is sensitized comes into contact with two IgE molecules on the mastic surface, his disagrail is activated through a calcium -dependent mechanism. This involves the release of preformed mediators and the activation of the synthesis of new and more powerful mediators.



Mastocytes are primordial cells in allergic response<sup>4</sup> and their activation occurs when antigen comes into contact with two IgE molecules on its surface by triggering degranulation and release of pre-formed factors from which the most relevant is histamine although there are other factors that are also also factors that are also activated and actively participate in the inflammatory reaction must be forgotten. Heparin, proteolytic enzymes and metabolites of the arachidonic acid are highlighted. Both degradation roads are involved in this process, cyclooxygenase and lipoxigenase, so prostaglandins, leukotrienes and thromboxanos will be produced. Chemotactic substances, as a mediator of preformed mast cells that attract new mastocytes and eosinophils and platelet activation factor (Smith; Brown, 2021, Jones et al., 2015, Cruz et al., 2017).

Acute allergic conjunctivitis is a sudden onset that affects the eyelids and the conjunctiva in the form of Blefaroconjunctivitis. This is an immediate reaction of type I after direct contact with the allergen. It is typically characterized by sudden and very intense itching, accompanied by the immediate appearance of diffuse conjunctival hyperemia, rapidly developing eyelid edema and eczematosa reaction. In very serious cases, general symptoms such as hypotension, glottis edema and sometimes cardiac arrhythmias are associated. These last two are especially serious for the risk of death they cause (Dudeja et al., 2019, Chigbu; Coyne, 2015).

Seasonal allergic conjunctivitis is the most common allergic eye disease and is usually found in a widespread context of allergies; The most common is rhinoconjunctivitis. We can classify them in seasonal, when there are recurring episodes of conjunctivitis coincident with pollination, or chronic, in which signs and symptoms persist permanently. In the latter case, it is also possible to the presence of acute episodes. It commonly affects young children and adults, often with personal or family history of atopy. The pathogenic mechanism of this disease is based on the degranulation of mast cells and basophils that occurs due to a type I hypersensitivity reaction when allergen reaches the nasal or conjunctival mucosa (MORAIS; PEREIRA, 2019).

The seasonal form occurs recurrently in relation to allergen exposure. The main symptoms are itching, eyelid edema and conjunctival (milky and swollen aspect of the conjunctive aspect due to



the presence of edema). It is usually accompanied by nasal symptoms such as rhinorrhea or sneezing. The most frequent etiopathogenic agents are usually pollen and mites and therefore begin in the form of crisis in early spring. The chronic form is characterized by the presence of basic symptoms throughout the year, although it is less pronounced than in seasonal form, and may have exacerbations. In these patients, the most common allergens are domestic mites (*dermatophagoides pteronysimus*), mold, penalties and animal hair. They are more often in winter and a third of these patients, in addition to eye symptoms, suffers from chronic rhinitis (SANTOS, 2018, Ferreira; Carvalho, 2016).

Allergic conjunctivitis, as its etiology indicates, is not contagious, although inappropriate treatment or excessive eye manipulation favor the superinfection of the process. It is of great importance to insist with the patient so that it does not rub their eyes despite the itching symptoms they have. In addition to stimulating histamine secretion and subsequent aggravation of the disease, abrasions and small injuries may occur in the annexes and even in the eyeball itself. The propagation of pathogens by hands and the excessive growth of conjunctival bacterial flora are also favored (JONES et al., 2015).

It is advisable to maintain minimal measures of eyelid skin hygiene to control the excessive growth of conjunctival flora. In most cases, not only the conjunctiva is affected, but also the eyelid in the form of blepharitis. The skin has eczematous abrasions and reactions as well as dysfunction in the sebaceous glands. Therefore, it is important to keep it clean from secretions. Hygiene should be careful using non-abrasive soaps for the skin, and with maneuvers that do not worsen your condition. For this, we will use cleaning products that do not irritate or change skin pH. Currently there are specific prepared formulas for the gel or lotion eye area. Its dosage is variable: in the lighter forms once a day. In the most severe cases it is recommended to use two to three times a day, which should always be done carefully, avoiding any intense mechanical manipulation to avoid the release of histamine and taking care of the present lesions (SANTOS, 2018, Dudeja et al., 2019, Dara et al., 2022).

To relieve itching, the instillation of artificial tears as needed is advisable; This aims to achieve two goals: on the one hand, reduce the mechanical manipulation of the eye and, on the other, clean the surface of the eyeball of allergen, secretions, chemotactic agents released in the tear film and





regulate the bacterial flora. so that there is no excessive growth. Traditional or monodose forms can be used and preservative -free formulas are now preferred, as they have non -negligible irritating power that worsens symptoms. Moreover, because they do not contain preservatives in their formulation, they cause less discomfort when instilled and avoid the possibility of allergic reactions derived from them (Cruz et al., 2017).

The use of cold compresses also produces great relief. The cold, besides having a slight anesthetic effect, is a stabilizer of the mastic membrane, which reduces the release of histamine. Traditionally, home-losethouses are used with chamomile compresses, which are not always useful; In addition to not being sterile forms, where residues may remain, in some cases cross allergies may occur so that when used symptoms. Ocular baths themselves are widely used to relieve symptoms or attacks of intense itching. They have the disadvantage of contaminating the container used for this purpose, so after use should be carefully cleaned with soap and alcohol water and let it dry. This step is usually ignored, which increases the risk of superinfections. For this reason, it is preferable to perform irrigations with sterile and preservative saline solutions (Jones et al., 2015).

Topical antihistamines and mastic stabilizers are commonly used to treat allergic conjunctivitis. These drugs act by inhibiting the action of histamine, a key mediator in allergic reactions, and stabilizing mastocytes to prevent the release of histamine. Commonly used topical antihistamines include olopatadine, ketotiphen and oil, while mastic stabilizers include sodium nedochromil and sodium chromoglycate. Studies have shown that these treatments are effective in reducing symptoms such as itching, redness and short -term tearing (Castillo et al., 2015, Dudeja et al., 2019, Dara et al., 2022).

Combined therapies that include antihistamines and mastic stabilizers were considered particularly effective. For example, olopatadine, which has antihistamine and masto-stabilizer properties, has shown significant relief from the symptoms of allergic conjunctivitis. Other combined treatments include Bepotastin and Alcraftadine, which also have double action and were considered effective in clinical trials (Dudeja et al., 2019, Chigbu; COYNE, 2015).



Several studies have compared the effectiveness of different topical treatments. For example, a study comparing olopatadine (0.1%), bepotastin (1.5%) and alkraftadine (0.25%) found that all three medications were equally effective in resolving mild to moderate allergic conjunctivitis symptoms with Most patients reporting complete relief after one week of use. Another study in Western Rajhast also concluded that there was no significant difference in the efficacy of olopatadine, bepotastin and alkaftadine in the treatment of allergic conjunctivitis (Dudeja et al., 2019, Dara et al., 2022).

Environmental, particularly allergen and pollutant factors transported by the air play a significant role in the incidence and severity of allergic conjunctivitis. Topical antihistamines and mast cell stabilizers isolated or in combination are effective treatments to control the symptoms of allergic conjunctivitis. Comparative studies suggest that more recent drugs with combined actions of mastocyte and antihistamines stabilization, such as solopatadine, bepotastin and alkoftadine, are equally effective in symptomatic relief.

## **Conclusion**

Research on the management of allergic conjunctivitis in children highlights the complexity and the importance of addressing this condition in a multifaceted manner. The results indicate that while there are several treatment options, from simple preventive measures to advanced biological therapies, variability in response to treatment and difficulty in completely avoiding exposure to allergens continue to be significant challenges. The identification of specific allergens and the education of parents and caregivers are crucial for effective disease management. In addition, research reinforces that allergic conjunctivitis is not only a matter of eye health, but also a problem that can negatively impact children's quality of life, interfering with their school performance, daily activities and overall well-being. Therefore, effective management strategies should consider not only medical aspects, but also the social and educational factors that influence the disease.

Treatment of allergic conjunctivitis involves a range of treatment options, from traditional



topical antihistamines and mastocyte stabilizers to advanced nanotechnology-based drug administration systems. Double -acting and corticosteroid agents provide additional therapeutic benefits, while immunotherapy offers a long -term solution for pediatric patients. In progress research continues to explore new therapeutic targets to improve the management of this common eye condition.

Advances in understanding the immunological mechanisms of allergic conjunctivitis open new possibilities for the development of more specific and effective therapies. However, to maximize the benefits of these advances, it is essential to ensure adherence to treatment and implementation of educational programs directed to parents and caregivers. Improvement in the management of allergic conjunctivitis in children requires an integrated approach that combines effective treatments, adequate education and prevention strategies. This integrated approach has the potential to significantly improve the quality of life of affected children, reduce the frequency and severity of recurrences and contribute to the development of more personalized and effective clinical practices.

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