

## Clinical Outcomes of Allergic Conjunctivitis Treated with Antihistamine Eye Drops and Eye Washing in Abidjan

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Allergic conjunctivitis is common in young people living in urban areas and is often associated with atopy. This study aimed to evaluate the effectiveness and safety of antihistamine eye drops, as well as their impact on quality of life. This prospective descriptive study was conducted over six months with seventy-seven patients suffering from allergic conjunctivitis at the Department of Ophthalmology at the University Teaching Hospital of Cocody in Abidjan. Data collected included sociodemographic characteristics, allergy history, clinical data, prescribed treatments, symptom progression, patient satisfaction and adverse effects. We then compared our results with data from the literature. A total of 77 patients were included in the study. The majority were female (64.9%), with an average age of 20.4 years, and were pupils or students. Personal (71.4%) and family (19.5%) histories of allergies were present. Olopatadine eye drops were prescribed to 62.3% of patients, at a dosage of one drop twice daily (88.3%). We observed rapid improvement (in less than 15 minutes) in 70% of patients, and satisfaction reached 90.9% when eye washing was performed beforehand. Our research team reported no adverse effects or relapses during follow-up. Antihistamine eye drops, particularly olopatadine, are highly effective and well tolerated, especially when used alongside eye washing. Appropriate management and patient education are necessary to improve the quality of life of patients with atopic conditions. Longer-term studies will enable the durability of the results to be evaluated.

**Keywords:** Allergic conjunctivitis; Antihistamines; Atopic;  
Efficacy Olopatadine eye drops; Tolerance; Safety.

Conjunctivitis is the inflammation of the membrane that covers the eye and eyelids. It is a common condition affecting children and adolescents. It can be caused by various factors,

including infection, allergies, and irritation. Allergic conjunctivitis is particularly widespread among these causes. Symptoms include itching, redness, tearing and a burning sensation in the

eyes and eyelids. This can impact the quality of life of those affected.<sup>1</sup> In fact, allergic conjunctivitis is triggered by an abnormal immune response to allergens. This causes the release of inflammatory mediators, notably histamine, by mast cells. This leads to the characteristic ocular symptoms.<sup>2</sup>

Furthermore, allergic conjunctivitis encompasses five clinical forms: seasonal and perennial conjunctivitis; vernal keratoconjunctivitis (VKC); atopic vernal keratoconjunctivitis; giant papillary conjunctivitis; and contact allergy reactions involving the palpebral and conjunctival areas. VKC and Tropical Endemic Limbal Conjunctivitis (TELC) are twin pathologies.<sup>3</sup> The first, VKC, relates to Europe, while the second relates to Africa. The difference is due to sunlight exposure. TELC is common in Africa and occurs in countries with high levels of sunlight exposure. Without treatment, it can lead to serious complications, including blindness. It is a non-contagious yet disabling condition which has a significant impact on public health, affecting schooling, daily comfort and family healthcare expenses. Therefore, early management and appropriate treatment are required to avoid these severe complications. The treatments used for allergic conjunctivitis include antihistamines, mast cell stabilizers and corticosteroids. However, managing allergic conjunctivitis<sup>6</sup> remains challenging in clinical practice. Even though antihistamine eye drops are essential for managing these conditions, treatment protocols that are not always standardized can lead to errors.<sup>7</sup>

In Côte d'Ivoire, the treatment of choice for allergic conjunctivitis remains antihistamines in the form of eye drops or tablets. The aim is to alleviate symptoms such as itching, redness and excessive tearing. However, the predominance of these eye drops, despite the availability of other therapeutic options, raises questions about their actual effectiveness and suitability in this specific context. Indeed, antihistamine eye drops are widely used as a first-line treatment, particularly at the Cocody University Hospital Centre (CHU), but their effectiveness and usage protocol are not always standardised or evaluated locally. The variability of clinical responses, the diversity of available molecules and the risk of therapeutic errors in a context where other

treatments exist highlight the need to evaluate their specific efficacy. Furthermore, most of the available data originates from different populations and contexts, which justifies a targeted study to confirm the usefulness of antihistamine eye drops in managing allergic conjunctivitis in Côte d'Ivoire. This study will help to optimise patient management, fill the gap in local data and improve the impact on patients' daily activities, as well as reducing potential complications related to poor therapeutic management. The aim of the study was to determine the impact of antihistamine eye drops on allergic conjunctivitis in patients being treated at the Teaching Hospital of Cocody, with the goal of better guiding and harmonising therapeutic practices for allergic conjunctivitis among specialists. The aim was to evaluate the effectiveness of antihistamine eye drops in treating allergic conjunctivitis.

## MATERIALS AND METHODS

**Study setting, type, period:** This descriptive, prospective cohort study ( $n = 77$ ) was conducted over six months (November 2024 to April 2025) in the ophthalmology department at the University Hospital (CHU) in Cocody, Abidjan, Côte d'Ivoire. The study describes the management of allergic conjunctivitis based on clinical criteria and Diallo's classification.

**Sample and sampling:** According to the standard statistical Schwartz formula, the minimum sample size was calculated to be 73 patients based on an estimated prevalence of 5% ( $P = 0.05$ ) is the prevalence of allergic conjunctivitis.<sup>8</sup> In total, 77 patients were included in our study.

**Patient selection methods:** During consultations, we included symptomatic patients with a confirmed diagnosis of allergic conjunctivitis who had not recently taken antihistamines and who provided informed consent. Patients with associated eye conditions, a history of antihistamine allergy, or who were pregnant or breastfeeding were excluded.

**Procedures and diagnosis:** The clinical diagnosis was based on a combination of physical signs, such as bilateral red eyes without pain, itching, or tearing, as well as no decrease in visual acuity, and the stage of the disease, which was assessed according to the DIALLO classification. Identification of allergens was done through a

medical questionnaire combined with a review of allergy test results.

#### The studied variables

- Sociodemographic characteristics: (Age, sex, occupation),
- Clinical and therapeutic: (Allergic history (personal/family), type and duration of conjunctivitis, treatment protocol (type of eye drops, dosage, and duration),
- Follow-up and main outcome measure: Clinical course (improvement of itching, redness, and tearing), time to therapeutic response, overall effectiveness, treatment tolerance, safety, quality of life, relapse rate, and side effects.

Data collection tools and analysis: Data were collected from medical records using a standardized survey form, entered into Microsoft Excel with double quality checks, and analyzed using Epi Info software (v7.2.5). Qualitative variables are presented as counts and percentages, while quantitative variables are presented as means

± standard deviation or medians. No comparative analysis was performed.

#### Ethics

The methodology was approved. Written informed consent, data anonymity, and confidentiality were strictly maintained.

## RESULTS

### Sociodemographic data

The female sex was predominant, making up 64.9% of the sample, with a sex ratio of 0.54. The most represented age group was 2-15 years old (39%), with an average age of 20.43 years. Most of the patients were students and pupils (44.2%) (Table 1).

### Clinical data

#### Medical history

Seventy-one percent of patients reported a history of allergies. Of these, only 19.5% were

**Table 1.** Sociodemographic characteristics of patients treated for allergic conjunctivitis (n=77)

| Characteristics of the patients |                    | N (%)      |
|---------------------------------|--------------------|------------|
| Sex                             | Female             | 50 (64.9)  |
|                                 | Male               | 27 (35.1)  |
| Age group (Years)               | Sex ratio          | 0.54       |
|                                 | [2–15[             | 73 (94.9)  |
|                                 | e" 45              | 4 (5.1)    |
|                                 | Mean [SD]          | 20.43      |
| Profession                      | Civil Servants     | 11 (14.3)  |
|                                 | Merchants          | 15 (19.5)  |
|                                 | Pupils/Students    | 34 (44.2)  |
|                                 | Workers, Craftsmen | 5 (6.5)    |
|                                 | Unemployed         | 12 (15.5)  |
|                                 | Total              | 77 (100.0) |

**Table 2.** Distribution of patients according to medical history (n=77)

| Medical History                 |                         | N (%)      |
|---------------------------------|-------------------------|------------|
| Personal allergy history        | Yes                     | 55 (71.4)  |
|                                 | No                      | 22 (28.6)  |
| Family allergies                | Yes                     | 15 (19.5)  |
|                                 | No                      | 62 (80.5)  |
| Type of family allergic disease | Asthma                  | 25 (33.3)  |
|                                 | Allergic conjunctivitis | 31 (40.0)  |
|                                 | Allergic rhinitis       | 21 (26.7)  |
|                                 | Total                   | 77 (100.0) |

familial. The most common allergy was allergic conjunctivitis (40%) (Table 2).

### Clinically

For 55.8% of patients, the delay between the onset of symptoms and the consultation date was at least one week. The delay before treatment began was one to two weeks for 54.5% of patients (Table 3).

The symptoms manifested as bilateral eye involvement in 98.7% of cases. The most commonly experienced symptoms were pruritus, conjunctival hyperemia, pain, tearing, and foreign body sensations (more than 50% of cases). Seasonal allergic conjunctivitis was the most common type (83.1%). Using the slit lamp, conjunctival

**Table 3.** Distribution of patients according to the delay between symptom onset and consultation, as well as between symptom onset and treatment start (n=77)

| Delay between the onset of symptoms, consultations, and the start of treatment. | N (%)             |            |
|---------------------------------------------------------------------------------|-------------------|------------|
| Delay between the onset of symptoms and consultation.                           | 4–5 days          | 2 (2.6)    |
|                                                                                 | 1 week            | 43 (55.8)  |
|                                                                                 | 2 weeks           | 12 (15.6)  |
|                                                                                 | 3 weeks           | 5 (6.5)    |
|                                                                                 | 1 month           | 7 (9.1)    |
|                                                                                 | 1 year            | 6 (7.8)    |
|                                                                                 | 2–3 years         | 2 (2.6)    |
| Time between the onset of symptoms and the start of treatment.                  | Less than 1 week  | 3 (3.9)    |
|                                                                                 | 1 to 2 weeks      | 42 (54.5)  |
|                                                                                 | More than 2 weeks | 31 (40.3)  |
|                                                                                 | Not specified     | 1 (1.3)    |
|                                                                                 | Total             | 77 (100.0) |

**Table 4.** Distribution of patients according to clinical data (n=77)

| Clinical data of patients                 | N (%)                            |            |
|-------------------------------------------|----------------------------------|------------|
| Type of involvement                       | Bilateral                        | 76 (98.7)  |
|                                           | Other                            | 1 (1.3)    |
| Type of allergic conjunctivitis           | TELC                             | 9 (11.7)   |
|                                           | Perennial                        | 3 (3.9)    |
|                                           | Seasonal                         | 64 (83.1)  |
|                                           | Not specified                    | 1 (1.3)    |
| Ophthalmologic physical signs (slit lamp) | Conjunctival hyperemia           | 44 (57.1)  |
|                                           | Papilla                          | 29 (37.7)  |
|                                           | Papilla + conjunctival hyperemia | 3 (3.9)    |
|                                           | Not specified                    | 1 (1.3)    |
| Stage (DIALLO Classification)             | Stage I                          | 9 (11.7)   |
|                                           | Not specified (another allergy)  | 68 (88.3)  |
| Sensibility of allergens                  | Yes                              | 75 (97.4)  |
|                                           | No                               | 2 (2.6)    |
| Type of allergens detected                | Unknown                          | 58 (75.3)  |
|                                           | Mites                            | 9 (11.7)   |
|                                           | Insects, Animals                 | 3 (3.9)    |
|                                           | Molds, Pollen                    | 3 (3.9)    |
|                                           | Cosmetics, Chemicals             | 2 (2.6)    |
|                                           | Total                            | 77 (100.0) |

Note: Several signs were observed in the same patient. Abbreviation: Tropical endemic limbo-conjunctivitis (TELC), according to the DIALLO classification system [9].

hyperemia (57.1%) and papillae (37.7%) were the most frequently observed ophthalmologic physical signs. According to DIALLO's classification, 11.7% of patients were in stage I of the disease. Of those patients, 97.4% were sensitive to allergens. The most prevalent allergen was dust

mites (11.7%), and 75.3% of cases had unknown allergens (Table 4).

#### Treatment

The antihistamines used were 0.1% olopatadine eye drops, which were used by 62.3% of patients. These are multi-action drugs. The

**Table 5.** Distribution of patients by treatment (n=77)

| Antihistamine treatment      |                                                     | N (%)      |
|------------------------------|-----------------------------------------------------|------------|
| Antihistamine eye drops used | Levocabastine 0.5%                                  | 29 (37.7)  |
|                              | Olopatadine 0.1%                                    | 48 (62.3)  |
| Type of antihistamine        | Anti-H1 (2nd generation)                            | 29 (37.7)  |
|                              | Antihistamines with multiple actions                | 48 (62.3)  |
| Dosage and frequency         | 1 drop $\times$ 2/day                               | 69 (88.3)  |
|                              | 1 drop $\times$ 3/day                               | 8 (11.7)   |
| Duration of treatment        | 1 to 2 weeks                                        | 1 (1.3)    |
|                              | 3 weeks                                             | 47 (61.0)  |
|                              | 1 month                                             | 26 (33.8)  |
|                              | 3 months                                            | 3 (3.9)    |
| Associated treatment         | Yes                                                 | 44 (57.1)  |
|                              | No                                                  | 33 (42.9)  |
| Type of associated treatment | "Sterile saline solution" 1 eye wash $\times$ 2/day | 43 (97.73) |
|                              | "Sterile saline solution" 1 eye wash $\times$ 3/day | 1 (2.27)   |
|                              | Total                                               | 77 (100.0) |

**Table 6.** Distribution of patients according to the monitoring of symptom progression, quality of life, and factors affecting the effectiveness of antihistamine eye drops (n=77)

| Monitoring of course and quality of life under antihistamine treatment | Modality                                       | N (%)      |
|------------------------------------------------------------------------|------------------------------------------------|------------|
| Improvement of functional signs (n=77)                                 | Itching                                        | 77 (100.0) |
|                                                                        | Redness                                        | 73 (94.8)  |
|                                                                        | Tearing                                        | 51 (66.2)  |
|                                                                        | Photophobia                                    | 8 (10.4)   |
|                                                                        | Pain                                           | 67 (87.4)  |
| Delay before improvement of signs (n=70)                               | [10–15[ min                                    | 29 (41.5)  |
|                                                                        | [15–20[ min                                    | 25 (35.7)  |
|                                                                        | > 20 min                                       | 16 (22.8)  |
| Impact of symptoms on daily activities                                 | Before treatment – Major impact                | 10 (13.0)  |
|                                                                        | Before treatment – Moderate impact             | 67 (87.0)  |
|                                                                        | During treatment – No impact                   | 77 (100.0) |
| Overall satisfaction                                                   | Satisfied                                      | 7 (9.1)    |
|                                                                        | Very Satisfied                                 | 70 (90.9)  |
| Factors affecting effectiveness (improvement < 15 min; n=53)           | Antihistamine eye drops alone                  | 13 (24.53) |
|                                                                        | Antihistamine eye drops + associated treatment | 40 (75.47) |
| Side effects related to treatment                                      | Yes                                            | 0 (0)      |
|                                                                        | No                                             | 77 (100.0) |
| Relapses after treatment                                               | Yes                                            | 0 (0)      |
|                                                                        | No                                             | 77 (100.0) |

most common administration frequency was one drop twice a day (88.3%). Treatment could last up to three weeks (61%). Another treatment was often used in conjunction with the antihistamines (57.1%), which was "Sterile saline solution" (97.73%) at a rate of one eye wash twice a day (Table 5).

#### **Monitoring the progression of symptoms, side effects, relapses, and quality of life**

Under antihistamine treatment, itching, redness, and pain improved by more than 80%. (The same patient could exhibit multiple symptoms, which explains the variation in numbers.) More than 70% of patients experienced symptom improvement within 10 to 15 minutes after antihistamine administration. Before treatment, 87% of patients felt that the disease impacted their daily activities, but after treatment, this was no longer the case. Overall, patients were highly satisfied with the treatment (90.9%). Combining eye washing with sterile saline solution before antihistamine eye drops improved symptoms in less than 15 minutes (75.47%). Furthermore, none of the patients reported any treatment-related side effects or relapse (Table 6).

## **DISCUSSION**

### **Sociodemographic data**

Our study revealed that allergic conjunctivitis predominantly affects females (64.9%), with a sex ratio of 0.54. The cases of conjunctivitis were particularly prevalent among young subjects, especially children and adolescents, with an average age of about 20 years. Most of these subjects were students. This reflects the juvenile nature of the condition, which makes them vulnerable.

### **Clinical data**

*Personal allergic history* (71.4%), more significant than family history, was also mentioned in the Omédit<sup>10</sup> study of Grand Est where the prevalence of atopy ranged between 50 and 70%. However, the presence of family allergies (allergic conjunctivitis (40%), asthma (33.3%), allergic rhinitis (26.7%)) suggests a significant genetic or family environmental component in the occurrence of these conditions.

*Clinically*, the symptoms of allergic conjunctivitis lasted at least one week (55.8%)

and the involvement was mostly bilateral (98.7%), with a predominance of the seasonal form (83.1%). Often discovered at stage I of the Diallo TELC classification (11.7%), there was generally a delay of 1 to 2 weeks (54.5%) between the onset of symptoms and the start of treatment. While sensitivity to allergens was high (97.4%), no specific allergen had been identified (75.3%). This difference would be related to diagnostic limitations, detection techniques, or the diversity of local allergens.

### **Treatment**

Topical antihistamines with multiple actions were the first-line treatment, in accordance with recommendations (VIDAL data (2024)).<sup>11</sup> Olopatadine 0.1% (62.3%) was the most used molecule, at a dosage of one drop twice a day (88.3%) for about 3 weeks (61%), close to the dosages recommended by the ANSM (2024) (85%).<sup>12</sup> An associated treatment (57.1%), based on saline solution, allowed eye washing before the administration of any treatment (one wash twice a day (97.73%) of cases), which emphasizes the importance of complementary measures in optimizing the therapeutic response in management.

### **The progression of symptoms and the impact on quality of life**

The clinical course under treatment was favorable, with rapid and significant improvements in symptoms such as itching, conjunctival hyperemia, and pain within 15 minutes. More than 80% of patients experienced improvement in these symptoms within 15 minutes, and 75.47% experienced improvement within this time frame. This aligns with the studies by Doan<sup>13, 14</sup> which showed that eye washing influences the treatment of allergic conjunctivitis by reducing the allergenic load and optimizing the action of antihistamine treatments, thus promoting a faster improvement of symptoms.<sup>13, 14</sup>

The impact of the disease on daily activities decreased significantly during treatment, and patient satisfaction was high (90.9%). However, improvement in visual acuity remained moderate, confirming that antihistamines act more specifically on functional symptoms.

### **Treatment follow-up**

The follow-up revealed good therapeutic tolerance, with no reported side effects or observed

relapses during the study period. While this suggests good compliance, the limited follow-up duration could explain the rarity of relapses. A recent study highlights that second-generation H1 antihistamines pose almost no risk of side effects.<sup>15</sup>

## CONCLUSION

In our context, allergic conjunctivitis mainly affects young, school-aged girls with a history of allergies. Treatment involves the use of antihistamine eye drops in conjunction with prior eye washing. This treatment has been associated with rapid improvement of symptoms and is generally well tolerated, leading to good adherence and an improved quality of life for patients.

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### Ethics statement

This research did not involve any human participants, animals, or material requiring ethical approval.

### Informed consent statement

This study did not involve human experiments, so informed consent was not required.

### Clinical trial registration

This research does not involve clinical trials.

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Not applicable.

### Author Contributions

Augustine Kakou: Conceptualization,

Methodology, Writing – Original Draft, Review and Editing, Supervision; Leffry Habib Ahikpa: Investigation, Data Collection, Analysis, Literature Survey, Writing; Yves Cédric Kee Mankoh: adaptation and revision of table, Analysis; Alain N'Guessan Yao: Writing – Original Draft – Review and Editing; Sita Kangah N'Zoué: Original Draft; Camille Koffi: Methodology, Analysis; Siméon Kra: Data Collection, Analysis, Supervision; Malika Cissé: Data Collection, Literature Survey; François Xavier Kouassi: Conceptualization, Supervision; Mamadou Kamagaté: Review and Supervision

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