Updates in Ocular Surface Wellness

Part 1: Ocular Allergy

Proceedings From an Expert Roundtable Discussion

faculty

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A supplement to REVIEW OF OPTOMETRY
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This educational activity consists of a case report and ten (10) study questions. The participant should, in order, read the Learning Objectives contained at the beginning of this activity, read the material, answer all questions in the post test, and complete the Activity Evaluation/Credit Request form. To receive credit for this activity, please follow the instructions provided below in the section titled To Obtain CE Credit. This educational activity should take a maximum of 2.0 hours to complete.

Content Source
This continuing education (CE) activity captures content from a roundtable discussion.

Activity Description
Eye care providers face multiple challenges in managing ocular surface disorders including ocular allergy and dry eye. Studies show that ocular allergies are often underdiagnosed and often not treated optimally. Recently, a group of experts convened to discuss their insights and approaches for managing patients with ocular allergy including special considerations for patients wearing contact lenses. This CE activity brings you highlights from these discussions in a 2-part series: Part 1 focuses on Ocular Allergy, Part 2 on Dry Eye.

Target Audience
This educational activity is intended for optometrists.

Learning Objectives
Upon completion of this activity, participants will be better able to:

- Make a differential diagnosis in patients with ocular allergy
- Select the therapy that is most appropriate for the patient’s diagnosis and phase of ocular allergy
- Incorporate current approaches to successfully manage contact lens wearing patients who also have ocular allergy
- Counsel patients on proactive measures for managing ocular allergy

Accreditation Designation Statement
This course is COPE approved for 2 hours of CE credit for optometrists.

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**Introduction**

Ocular allergy is a common condition associated with significant morbidity and economic burden from both direct and indirect costs. It encompasses a group of type I and type IV hypersensitivity-mediated ocular surface diseases that include seasonal allergic conjunctivitis (SAC), perennial allergic conjunctivitis (PAC), atopic keratoconjunctivitis (AKC), vernal keratoconjunctivitis (VKC), and contact lens–induced papillary conjunctivitis (CLPC; previously known as giant papillary conjunctivitis). According to various studies, the overall prevalence of ocular allergy ranges between 15% and 40%. However, SAC and PAC are the most common forms, accounting for up to 95% of allergic eye disease in the United States.

While SAC and PAC are not generally considered sight-threatening diseases, they can adversely affect visual function, contact lens wear comfort, work productivity, sleep, and quality of life. Numerous studies have also shown the association between excessive ocular itching and the development of keratoconus. In addition, ocular allergy has cosmetic sequelae associated with having red, irritated eyes and the potential for frequent, long-term scratching to cause progressive collagenous stress along the eyelid skin. Despite its many consequences, allergic conjunctivitis is underdiagnosed and undertreated. Optometrists, as primary eye care providers, are positioned to address these problems.

Several factors can contribute to the suboptimal management of patients with allergic conjunctivitis. Many patients self-treat their condition with over-the-counter (OTC) medications and do not even present for care to health care providers. Some patients with allergic conjunctivitis may seek attention for concomitant atopic diseases (ie, asthma, allergic rhinitis, urticaria, or eczema), and the primary care clinician or dermatologist who is managing those comorbid conditions may overlook the patient’s ocular manifestations. Due to the periodic nature of reactions in patients with SAC and PAC, it is likely that even those patients who regularly see an eye care provider for other reasons may not have active allergic symptoms at the time of their visit. Among patients who present for care because of signs and symptoms of allergic eye disease, the diagnosis may still be missed because other common ocular surface conditions with overlapping manifestations—such as dry eye, meibomian gland dysfunction (MGD), and contact lens–related discomfort—may coexist.

The aim of this continuing education activity is to improve care for patients with allergic conjunctivitis by raising awareness of its prevalence and burden, presenting strategies to increase its recognition, and reviewing approaches for safe and effective treatment.

**Diagnosis**

Allergic conjunctivitis is usually a clinical diagnosis based on the findings from the patient’s history and physical examination.

**History**

Obtaining an accurate medical history from each patient is important to elicit the characteristic signs and symptoms of allergic conjunctivitis, the causative allergens, the presence of other allergic disorders, and the use of medications for controlling allergy signs and symptoms. Considering the high prevalence of SAC and PAC and the opportunity to provide preemptive care, clinicians should probe for these conditions as part of the history in all patients.

Itching is the hallmark symptom of allergic conjunctivitis, and in patients who present with red, irritated eyes, a chief complaint of itching should direct the diagnostic evaluation toward allergy. However, absence of a report of itching does not necessarily rule out allergic conjunctivitis since some patients experiencing itchy eyes may describe it using other terms (eg, burning, stinging, or irritated eyes). Other common complaints of patients with allergic conjunctivitis are tearing, redness, and eyelid swelling, while chemosis is seen in severe cases. Most patients will also have nasal symptoms, including nasal itching, congestion, or a runny nose.

The patient’s medical history should also elicit whether or not the patient is using any anti-allergy medications at any time throughout the year. This information can explain an incomplete clinical picture of allergy in a patient with active disease and identify an underlying cause for problems with dry eye or contact lens discomfort. For example, patients who are using an oral antihistamine medication may not have prominent itch, but may be suffering from the ocular drying effects of those medications. In addition, the patient’s medication history can trigger the clinician to inquire about SAC or PAC in patients who are seen when their allergies may not be active.

Electronic medical records can help in obtaining the medication history, although the patient’s record may not include a full list of medications and in particular may be missing information about OTC products. Asking specifically about agents purchased without a prescription is important considering that anti-allergy agents are top-selling OTC medications and because some patients do not consider OTC products as “medications.”

Recognizing that patients may have poor recall of medications they used several months earlier, it is also helpful to routinely ask patients to bring in bottles of any medications they have used since their last visit. Patients who do not bring in their medications or are unable to provide product names should be asked about the reason why they were using the medication. This may help the clinician in determining the class of medication that was taken.

If the medication history shows a patient is self-treating for allergy with an oral antihistamine and does not have active disease, further questioning is needed to determine whether or not allergic conjunctivitis is a problem. Although most patients with seasonal and perennial allergies suffer with both nasal and ocular manifestations, it is possible that only the nose or only the eyes are affected. Even if the patient denies ocular allergy symptoms, the optometrist must still...
consider whether or not the use of an oral antihistamine for allergic rhinitis may be causing dry eye.

Clinical Examination

The ocular examination of patients with allergic conjunctivitis reveals chemosis and hyperemia of the palpebral and bulbar conjunctiva (Figure 1), and there may also be mild papillae on the palpebral conjunctiva (Figure 2). Patients with allergic conjunctivitis may also have periorcular skin changes, especially if they have concurrent allergic rhinitis or rhinosinusitis. These signs include a horizontal crease across the bridge of the nose that develops from habitual wiping of a runny nose (“the allergic salute”) and darkened circles under the eyes (“allergic shiners”) (Figure 3) from allergic rhinitis-related vascular congestion.

Differential Diagnosis

Establishing a diagnosis of allergic conjunctivitis can be challenging because it shares signs and symptoms with other common conditions. As itching is not specific to allergic conjunctivitis, it can be helpful to ask patients to demonstrate how they scratch to relieve the itch. Itch associated with allergic conjunctivitis is typically worst in the nasal canthal region. Itching of the upper eyelid skin suggests dermatitis, and itching along the eyelash margin is more common in blepharitis. Some patients may pull their lower eyelid down and rub or scratch the conjunctiva in the lower fornix area, demonstrating a mucous fishing syndrome.

Since itching, redness, tearing, and other symptoms of ocular surface irritation are manifestations of both allergic conjunctivitis and dry eye, it may be appropriate to perform a full ocular surface workup to identify whether the patient might have dry eye alone or as a comorbid condition. Dry eye and allergic conjunctivitis commonly coexist, and each condition can exacerbate the other. The natural flushing of antigens from the ocular surface by the patients’ tears is reduced in dry eye while patients with allergy may be using medications that dry the ocular surface. In addition, ocular surface irregularities and inflammatory mediators associated with allergic disease can contribute to the pathophysiology of dry eye.

Ocular itching is also a feature of AKC, VKC, and CLPC, and it is important to differentiate these ocular allergies from allergic conjunctivitis because they require different management strategies (Table 1). Furthermore, AKC and VKC are potentially sight-threatening. Compared with SAC and PAC, AKC and VKC are usually associated with more intense itching and a stringy rather than a clear mucoid discharge. Cobblestone papillae of the superior palpebral conjunctiva, along with lid and cornea involvement, are also features of AKC (Figure 4) and VKC (Figure 5) that are not seen with SAC or PAC.

<table>
<thead>
<tr>
<th>Findings</th>
<th>AC</th>
<th>VKC</th>
<th>AKC</th>
<th>CLPC</th>
</tr>
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<tbody>
<tr>
<td>Itch</td>
<td>+</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Grittiness</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
<td>+</td>
</tr>
<tr>
<td>Seasonal variation</td>
<td>+</td>
<td>+</td>
<td>+/-</td>
<td>+/-</td>
</tr>
<tr>
<td>Chemosis</td>
<td>+</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
</tr>
<tr>
<td>Cobblestoning</td>
<td>--</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Discharge</td>
<td>Clear mucoid</td>
<td>Stringy mucoid</td>
<td>Stringy mucoid</td>
<td>Stringy mucoid (especially in the morning)</td>
</tr>
<tr>
<td>Eyelid skin involvement</td>
<td>--</td>
<td>+</td>
<td>+</td>
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</tr>
</tbody>
</table>

AC = allergic conjunctivitis; VKC = vernal keratoconjunctivitis; AKC = atopic keratoconjunctivitis; CLPC = contact lens–papillary conjunctivitis

Figure 1. This image shows the typical appearance of the eye in a patient with seasonal allergic conjunctivitis. Note the pronounced diffuse hyperemia and eyelid swelling.

Photo courtesy of Mile Brujic, OD, FAAO

Figure 2. A fine, velvety-looking papillary reaction may be seen upon upper eyelid eversion in many patients with allergic conjunctivitis, particularly those who wear contact lenses.

Photo courtesy of Alan G. Kabat, OD, FAAO

Figure 3. “Allergic shiners” can be seen in patients with allergic rhinoconjunctivitis. These dark circles below the eyes appear in association with swollen and congested small blood vessels beneath the skin.

Photo courtesy of Christine W. Sindt, OD, FAAO
CLPC is also associated with more severe pruritus than allergic conjunctivitis. Eversion of the upper eyelid allows the clinician to examine for papillary changes in the upper tarsal plate that are pathognomonic of CLPC (Figures 6 and 7) and should be performed in all contact lens wearers, whether or not they are symptomatic. The presence of a velvety appearing tarsal plate in asymptomatic patients is an early sign of CLPC. Detection of this change allows for timely intervention that can prevent progression to the development of frank giant papillae and the unfortunate sequelae of contact lens intolerance.

Patients who are contact lens wearers may also develop red, irritated eyes for a variety of other reasons that are related to lens fit, lens material and/or design, hygiene, wearing schedule, or a lens-care solution interaction. These problems may occur in isolation or coexist and exacerbate allergic conjunctivitis. Patients with allergy who also wear contact lenses will often experience greater symptoms of redness, itching, and discomfort than those patients who do not wear contact lenses. Having patients temporarily discontinue contact lens wear can help to rule out a contact lens–related cause, but this idea is often rejected by some patients, especially if they are not highly symptomatic. Determining if the patient's signs and symptoms of itching and redness worsen after the lenses are inserted in the morning can direct the evaluation toward identifying possible sources of contact lens–related ocular redness and irritation. Infectious causes of conjunctivitis (bacterial, viral, chlamydial) should also be considered.

**Treatment of Allergic Conjunctivitis**

Effective treatment of allergic conjunctivitis incorporates nonpharmacologic and pharmacologic interventions. Nonpharmacologic strategies focus primarily on environmental measures to reduce allergen exposure. These strategies include limiting time spent outdoors during periods when allergen levels are high and wearing sunglasses to protect the eyes from additional allergen loads while outside. Showering and washing or rinsing the hair at night before going to bed minimizes the allergen load that may be in the hair. Furthermore, although difficult, avoiding eye rubbing is important as it can mechanically induce mast cell release and also introduce allergens from the skin. Since many patients are allergic to dust mites and because mites accumulate in pillows and bedding, patients may be advised about using hypoallergenic bedding, changing their sheets frequently and washing them in hot water, and putting their pillow into a hot dryer for 20 minutes to kill dust mites. Keeping the windows and doors closed at home, taking shoes and outerwear off at the door, removing carpets from floors, and using a high-efficiency particulate absorption filter to remove allergens from the circulating air are all strategies to reduce the indoor allergen burden.

In addition to strategies for allergen avoidance, patients can be advised about topical nonpharmacologic measures to control allergic conjunctivitis. The use of artificial tears, isotonic saline, or rewetting drops by contact lens wearers can be a helpful strategy to dilute and flush away allergens and inflammatory mediators. In general, preservative-free formulations are preferred to avoid any potential for preservative-induced hypersensitivity, and refrigeration of these topical products is
<table>
<thead>
<tr>
<th>Generic (brand) name</th>
<th>Indication</th>
<th>Pediatric use</th>
<th>Dosing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OTC PRODUCTS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>H1-antagonist/mast cell stabilizer</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ketotifen fumarate, 0.025%, (Alaway, Claritin Eye, Eye Itch Relief, Zaditor, Zyrtec Itchy Eye, generic)</td>
<td>Temporary relief of itchy eyes due to ragweed, pollen, grass, animal hair, and dander</td>
<td>≥3 years</td>
<td>twice a day, every 8 to 12 hours</td>
</tr>
<tr>
<td><strong>Decongestant/antihistamine</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naphazoline/pheniramine (Naphcon-A, Opcon-A, Visine-A)</td>
<td>Temporary relief of minor eye symptoms of itching and redness caused by ragweed, pollen grass, animal dander, and hair</td>
<td>≥6 years</td>
<td>1 or 2 drops up to 4 times daily</td>
</tr>
<tr>
<td><strong>PRESCRIPTION PRODUCTS</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Antihistamines</strong></td>
<td></td>
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<tr>
<td>Emedastine difumarate, 0.05%, (Emadine)</td>
<td>Temporary relief of the signs and symptoms of AC</td>
<td>≥3 years</td>
<td>up to 4 times a day</td>
</tr>
<tr>
<td><strong>Dual acting antihistamine/mast cell stabilizers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcaftadine, 0.25%, (Lastacaft)</td>
<td>Prevention of itching associated with AC</td>
<td>≥2 years</td>
<td>once a day</td>
</tr>
<tr>
<td>Azelastine, 0.05%, (Optivar + generic)</td>
<td>Treatment of itching of the eye associated with AC</td>
<td>≥3 years</td>
<td>twice a day</td>
</tr>
<tr>
<td>Bepotastine besilate, 1.5%, (Bepreve)</td>
<td>Treatment of itching associated with AC</td>
<td>≥2 years</td>
<td>twice a day</td>
</tr>
<tr>
<td>Epinastine HCl, 0.05%, (Elastat + generic)</td>
<td>Prevention of itching associated with AC</td>
<td>≥2 years</td>
<td>twice a day</td>
</tr>
<tr>
<td>Olopatadine HCl, 0.1%, (Patanol)</td>
<td>Treatment of the signs and symptoms of AC</td>
<td>≥3 years</td>
<td>twice a day (at an interval of 6 to 8 hours)</td>
</tr>
<tr>
<td>Olopatadine HCl, 0.2%, (Pataday)</td>
<td>Treatment of ocular itching associated with AC</td>
<td>≥2 years</td>
<td>once a day</td>
</tr>
<tr>
<td><strong>Mast cell stabilizers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cromolyn sodium, 4%, (Crolob, generic)</td>
<td>Treatment of VKC, vernal conjunctivitis, and vernal keratitis</td>
<td>≥4 years</td>
<td>1 to 2 drops 4 to 6 times daily</td>
</tr>
<tr>
<td>Lodoxamide tromethamine, 0.1%, (Alomide)</td>
<td>Treatment of VKC, vernal conjunctivitis, and vernal keratitis</td>
<td>≥2 years</td>
<td>1 to 2 drops 4 times a day for up to 3 months</td>
</tr>
<tr>
<td>Nedocromil sodium, 2%, (Alocril + generic)</td>
<td>Treatment of itching associated with AC</td>
<td>≥3 years</td>
<td>1 to 2 drops up to twice a day</td>
</tr>
<tr>
<td>Pemirolast potassium, 0.1%, (Alamast)</td>
<td>Prevention of itching of the eye due to AC</td>
<td>≥3 years</td>
<td>1 to 2 drops 4 times a day</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ketorolac tromethamine, 0.5%, (Acular + generic) (NSAID)</td>
<td>Temporary relief of ocular itching due to SAC</td>
<td>≥2 years</td>
<td>4 times a day</td>
</tr>
<tr>
<td>Loteprednol etabonate, 0.2%, (Alrex) (Ester corticosteroid)</td>
<td>Temporary relief of the signs and symptoms of SAC</td>
<td>Safety and effectiveness not established in pediatric patients</td>
<td>4 times a day</td>
</tr>
</tbody>
</table>

*The www.pdr.net drug summary for ketotifen fumarate lists antihistamine for mechanism of action. However, in addition to being a noncompetitive H1-antagonist, ketotifen also has mast cell stabilizing activity.11

AC = allergic conjunctivitis; H1 = histamine1; NSAID = nonsteroidal anti-inflammatory drug; SAC = seasonal allergic conjunctivitis; VKC = vernal keratoconjunctivitis

1 The www.pdr.net drug summary for ketotifen fumarate lists antihistamine for mechanism of action. However, in addition to being a noncompetitive H1-antagonist, ketotifen also has mast cell stabilizing activity.11

AC = allergic conjunctivitis; H1 = histamine1; NSAID = nonsteroidal anti-inflammatory drug; SAC = seasonal allergic conjunctivitis; VKC = vernal keratoconjunctivitis
Antigen binds to IgE
Mast cell degranulates

Preformed mediators
- Histamine
- Proteases
- Heparin

Newly formed mediators
- Eicosanoids (prostaglandins, leukotrienes, thromboxanes)

Chemokines & cytokines
- Platelet-activating factor
- IgE expression
- Upregulation of adhesion molecules

Itching
- Chemosis
- Redness
- Tearing
- Mucus secretion
- Nerve stimulation
- Leukocyte infiltration

Helpful as the cold solution is both soothing and acts to counteract the elevated tissue temperature associated with inflammation.

Medical Therapy
The feasibility of nonpharmacologic approaches for ocular allergy management varies depending on lifestyle issues and the causative allergen. While they may be sufficient for patients who are only mildly symptomatic, they are often unsatisfactory as a stand-alone measure. Therefore, medical therapy is the cornerstone for effective management of most patients with allergic conjunctivitis.

OTC and prescription products available for treating allergic conjunctivitis include medications that act as decongestants, antihistamines, mast cell stabilizers, antihistamine/mast cell stabilizers, and anti-inflammatory agents (Table 2). The role of these different classes as preventive therapy versus providing acute relief—as well as their effects on specific signs and symptoms—can be understood by considering the cellular and molecular mediators of the allergic cascade (Figure 8).

The various medications also differ in their recommended dosing frequency, which is an important issue for any medication as it affects compliance and therefore the likelihood of treatment success. Medications that require only once- or twice-daily dosing are also highly desirable for contact lens users who would need to remove their lenses at least once during the day to use a product that involves more frequent instillation.

Decongestants. Most topical OTC products sold for treating signs and symptoms of allergic conjunctivitis combine a decongestant (eg, naphazoline, tetrahydrozoline) with an antihistamine (eg, pheniramine). OTC products containing only a topical decongestant (eg, naphazoline, tetrahydrozoline, phenylephrine) are sold to relieve ocular redness, burning, irritation, and dryness caused by wind, sun, and other minor irritants.

Topical decongestants are adrenergic agonists that reduce redness by causing vasoconstriction. However, they have a relatively short duration of action and so require frequent
Corticosteroid treatment has a critical role for managing inflammation associated with the severe forms of ocular allergy, VKC, AKC, and CLPC, and is useful as a short-term intervention for controlling a severe presentation of acute SAC or PAC. In addition, corticosteroid treatment can be useful on a short-term basis for dry eye disease, which may be comorbid with allergy. Corticosteroids act on both the early and late phases of the allergic reaction by suppressing mast cell proliferation, inhibiting the production of multiple inflammatory mediators, and reducing the influx of inflammatory cells. There is conflicting information about the relative efficacy of corticosteroids versus antihistamine/mast cell stabilizers for relieving itching. Although an agent with antihistamine activity would be expected to provide faster onset of relief. Intraocular pressure (IOP) monitoring at follow-up visits is important for all patients being treated with a topical corticosteroid.

Nonsteroidal anti-inflammatory drugs act to prevent prostaglandin synthesis and desensitize pain receptors so that they decrease inflammation and itching. However, ketorolac tromethamine, 0.5%, is the only topical NSAID approved by the US Food and Drug Administration (FDA) for the management of allergic conjunctivitis, and it is not widely used because of the availability of more effective options and its high potential to cause burning and stinging with instillation. According to the prescribing information, up to 40% of the patients using ketorolac tromethamine, 0.5%, experienced burning and stinging.

**Patient Counseling**

Reviewing the available options with patients helps them to understand the rationale for their clinician’s therapeutic recommendations and engages them as partners in care, which can help to improve compliance. The discussion with patients on medications should include information about relative costs, dosing frequency, efficacy, and possible adverse reactions. It should conclude with a definitive recommendation and prescription for what the optometrist considers as the best option, although still making sure that patients understand other modalities can be tried if the first is unsatisfactory. Consider, for example, the situation in which a patient picks up a prescription and finds it is prohibitively expensive. Patients who have not been informed about viable alternatives may be displeased with their doctor and choose to self-treat with an OTC product and/or see another provider. Although it is important to be sensitive to cost issues, OTC products may offer less value than prescription products, at least, in part, because the OTC medications may require more frequent dosing. Providing patients with some suggestions about OTC products to try also puts the onus on them to go to the store, decide among a host of agents, and make the purchase. Handing patients a written prescription reduces reliance on patient follow-through, but still assumes the patient will bring the prescription to the pharmacy.

Sending a prescription directly to the pharmacy goes 1 step further and also reinforces the optometrist’s authoritative position. Follow-up visits will verify that patients are using their treatment and determine its success.

It is better to have patients schedule the visit before they leave the office than to suggest they call for an appointment.
Why Samples Are Not Always a Good Thing

Sometimes optometrists think they are doing patients a service by handing out medication samples. However, similar to seeing a mint left on a hotel pillow at night, patients may consider the sample a nice gesture, but assign little value to it because it is free. The end result is that they may be unlikely to use the product or even to remember its name.

In contrast, when patients are given a prescription for a medication along with an explanation of why that specific product was chosen, they are more likely to regard it as important and be compliant with the instructions for use.

Treatment Selection

Decisions on medical treatment for SAC or PAC depend on whether the patient needs relief from an acute flare-up or is being treated to prevent an allergic reaction.

An antihistamine/mast cell stabilizer is usually sufficient by itself for treating active disease in patients who have mild to moderate signs and symptoms of SAC or PAC.

An ophthalmic antihistamine/mast cell stabilizer can also improve nasal rhinitis, although patients with more than mild allergic rhinitis may need additional therapy. The use of a systemic antihistamine that will produce some ocular drying effects is generally best avoided in patients with allergic conjunctivitis. Alternatives include intranasal antihistamines and corticosteroids.

Patients with a moderate-to-severe flare of AC or PAC may be started simultaneously on a topical corticosteroid that is then tapered off when signs of inflammation improve. Anecdotally, most patients achieve an adequate response after only 1 or 2 weeks of corticosteroid treatment. Scheduling a follow-up visit 5 to 7 days after corticosteroid initiation will allow the clinician to evaluate its benefit and safety. Although all corticosteroids can be used to control ocular inflammation, loteprednol etabonate, 0.2%, is indicated specifically for relief of the signs and symptoms of SAC, and has a good safety profile with respect to risk of IOP elevation.

Patients with SAC may begin using an antihistamine/mast cell stabilizer prior to the start of allergy season and continue using the medication while allergen levels remain elevated. Although a mast cell stabilizer could also theoretically be prescribed for this purpose, it rarely is because it usually requires more frequent dosing and does not provide antihistamine activity that will help patients when challenged with allergens. A similar preventive approach using an antihistamine/mast cell stabilizer can be recommended to patients with PAC who are able to anticipate allergen exposure (eg, a patient who is allergic to horse dander and will encounter the animals on vacation). Patients with PAC who have year-round exposure to triggering allergens may be maintained on an antihistamine/mast cell stabilizer indefinitely. Again, medications with mast cell stabilizing activity alone might be considered instead for maintenance, but their more frequent dosing schedule can present a compliance issue, and they would not control symptoms if mast cell degranulation occurs.

Patients with comorbid allergic disorders may be referred to an allergist for further evaluation and optimal management of their nonocular symptoms.

Allergic Conjunctivitis in Patients Wearing Contact Lenses

Lens Selection and Care

Allergic conjunctivitis is an important contributor to contact lens intolerance as demonstrated by the results of a study showing that 75% of the patients with allergic rhinoconjunctivitis reported partial or absolute intolerance of their lenses. Although contact lenses can act as a barrier to airborne allergens, they can also serve as a vehicle for increasing allergen exposure by trapping environmental allergens and binding antigens from the tear film, ocular surface, lids, and lens care solutions. Considering that bacteria and bacterial products are well-recognized to be antigenic in patients with atopic dermatitis and allergic airway disease, it is plausible that microbial bioburden on the lens surface may also be a trigger for allergic reactions. This potential relationship is important considering the ubiquitous opportunities for microorganisms to accumulate on the lens surface.

Ideally, patients might be furloughed from contact lens wear when they are experiencing significant problems with allergic conjunctivitis. However, most patients will resist this idea, and it is impractical for others, such as patients with keratoconus whose visual function depends on gas permeable (GP) contact lens wear. Concern about the buildup of antigens on the contact lens surface provides a rationale for recommending daily disposable lenses to soft contact lens wearers who are suffering with allergic conjunctivitis, and there is clinical trial evidence showing the efficacy of this strategy for improving patient comfort. Daily disposable lenses provide the benefits of placing a new, clean lens on the eye at the beginning of every day. Thus, any deposition that may have occurred on the lens the prior day is not an exacerbating issue. Furthermore, the use of daily disposable lenses eliminates exposing the eye to lens care solution ingredients that can themselves precipitate allergic reactions.

As technologies have advanced with 2-week and monthly disposable lenses, there has also been a significant evolution in the daily disposable lens modality. Several product options are currently available in the daily disposable lens category that represent 3 different material types: hydrogel, silicone hydrogel, and water gradient technology. In addition, new wetting agents are being added to lenses in an attempt to improve the lens wearing experience.
There are no conclusive clinical trial data or other evidence on which to base recommendations for choosing any particular daily disposable product or material class. Different lenses within the same class may have unique chemical characteristics.

A new category of water gradient technology lenses made of deleficon A is the latest addition to the daily disposable market. This lens has a high dK silicone hydrogel core with an outer layer (~10% of the lens thickness) made of a nonsilicone hydrophilic polymer. The water content of the lens varies from 33% for the silicone hydrogel core to >80% on average for the outer layer in which the water content transitions to reach almost 100% at the surface. The lens surface is also unique in its level of lubricity; it was shown to have less impact on the prelens tear film surface quality than a daily disposable hydrogel lens made of nelficon A.34 With its moisture rich surface characteristics, the water gradient technology lens is a logical consideration in the challenging population of patients with ocular allergy.

When a daily disposable contact lens is not a viable option for a patient with ocular allergies who wears soft contact lenses, other strategies need to be put into place to optimize contact lens wear. This process begins with patient education and reinforcing the importance of thorough cleaning and other aspects of good lens hygiene practices. Making sure patients are rubbing and rinsing their lenses is critical in this population. In addition, clinicians should ascertain that patients have not strayed from using the lens care systems recommended to them.

For soft lenses, surfactant cleaners may be needed in rare instances, in addition to the multipurpose disinfecting solution that a patient may be using, as the surfactant cleaner assists in removing additional antigens from the lens surface of heavily inflamed ocular allergy sufferers. The use of a peroxide-based system for cleaning and disinfection should also be considered for these patients as it will minimize chemical exposure on the eye while effectively cleaning the lenses.

An alcohol-based surfactant cleaner is also effective for cleaning GP lenses. To help reduce allergen exposure, patients with GP lenses should be instructed to rinse the lens well with preservative-free saline before lens insertion. A peroxide-based cleaning and disinfection system is approved for use by the FDA with both soft and GP contact lenses, and should be considered in GP lens wearers with significant ocular allergies.

Among contact lens wearers, the prevalence of allergy is particularly high in patients with keratoconus.15 Patients with keratoconus require aggressive management of allergic conjunctivitis to limit eye rubbing that can contribute to their disease progression as well as allow them to maintain contact lens wear. Although small diameter GP lenses work well for patients with keratoconus, the challenge of ocular allergies can make lens wear much more difficult for this population. Edge awareness is especially problematic in allergic patients because they have a compromised and inflamed ocular surface. Large diameter GP lenses, such as scleral lenses, minimizes the lens edge interaction and provides an alternative for those patients experiencing significant comfort issues wearing small diameter lenses.

Medication Use With Contact Lens Wear
Effective treatment of allergic conjunctivitis using topical antihistamine/mast cell stabilizing agents can improve comfort in contact lens wearing patients.16,37 However, because soft contact lenses can absorb medications and act as a platform for sustained drug delivery,38 patients wearing soft contact lenses must be counseled not to use these allergy medications while wearing their lenses and to wait 10 to 15 minutes after instilling drops before inserting their lenses. Considering the risks associated with corticosteroid treatment (ie, IOP elevation, cataract formation, and secondary infection), it is best to discontinue wearing contact lens while patients are being treated with a corticosteroid.

Gas permeable lens materials do not absorb medications, and medication that adheres to the lens surface can be effectively removed with proper cleaning. Patients with keratoconus and others dependent on their GP lens may be allowed to continue wearing their contact lenses while being treated with a topical corticosteroid. However, the importance of meticulous lens cleaning, as well as instructions about not dosing the medication with the lens in the eye and waiting after medication dosing to insert the lens, must be reinforced.

Conclusion
Allergic conjunctivitis can have a significant impact on the quality of life for all individuals and poses particular problems for contact lens wearers. Establishing the diagnosis of allergic conjunctivitis by conducting an appropriate medical history and a thorough clinical examination of the patient is the first step to providing effective care. Optometrists must recognize the importance of being proactive in their efforts to identify allergy sufferers. Medical therapy can effectively relieve distress from the signs and symptoms of allergic conjunctivitis and, combined with allergen avoidance strategies, can limit allergic episodes in most patients. For optimal care, some patients may be best referred to an allergist, and for those who wear contact lenses, modern contact lens technology, good lens hygiene, and careful selection of care systems can facilitate continued comfortable wear.
References


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Look for the second CE module of Ocular Surface Wellness—Dry Eye in a coming issue.
Updates in Ocular Surface Wellness

Part 1: Ocular Allergy