Ocular Allergy in Children

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Case Scenario

In a beautiful morning in May, a 6 years old boy came in my clinic with his mother. The child was blinking frequently when he walked in. In many cases, blinking was just a bad habit in children, without any actual eye problems. Sometimes, young kids blinked because their eyelashes touched their eyes and made them itchy. In children with tendency to squint, they blinked to bring their eyes back to the forward looking direction. But it was another story for this child. His mother complained that he rubbed his eyes incessantly for some time already. He was also afraid of sunlight. Itchiness was the major symptom bothering the boy. Sometimes the eyes did get red. Moreover, he sneezed every morning and he was using some nasal spray for that already. When he was younger still, his airway was hypersensitive but was much better now. On closer look under the slitlamp, the conjunctiva was injected mildly. There were some punctate epithelial erosions on the cornea. When his upper eyelids were everted, I saw a lot of nodules arranged in a cobblestone style on the conjunctiva, which I called giant papillae. The major concern of the mother was the frequent blinking. With all the above findings, my major focus was his vernal keratoconjunctivitis.

This case history described one possible and not uncommon presentation of ocular allergy in children.

Introduction

Ocular allergy is a very common condition in children. In developed nations, it was reported to prevail at around 15 to 20% of children.1 They present to both primary physicians and ophthalmologists, as the allergy sometimes is not easy to be treated and is associated with significant ocular problems like corneal scarring. The most frequent presenting symptom is itchiness. In the mildest case, it can be the only hint that the child has ocular allergy as they may not have other signs. Other symptoms include red eyes, frequent rubbing of eyes, tearing, photophobia, foreign body sensation, burning and lid swelling. Many children have allergic rhinitis, eczema or asthma or all of them at the same time.

Broadly speaking, ocular allergy presents in three different clinical entities, though sometimes it may not be easy to distinguish among them. They are allergic rhinoconjunctivitis, vernal keratoconjunctivitis and atopic keratoconjunctivitis.

Allergic rhinoconjunctivitis

Allergic rhinoconjunctivitis is the most common form of ocular allergy. As you can tell from the name, there are both nasal and ocular symptoms. It is a type 1 hypersensitivity reaction to airborne antigens.2 It can recur in a seasonal pattern, with pollens being the most common allergens. It can also occur perennially, when the child is allergic to house dust mites, fungal allergens or other unknown airborne particles. Itchy eyes, lid oedema associated with sneezing and nasal discharge is a very common collection of presenting symptoms. Conjunctiva is commonly mildly injected with mild chemosis. Tiny papillae may be found on the upper tarsal conjunctiva. But giant papillae is not a feature of this disease.

It is the mildest form of ocular allergy, as it does not cause corneal ulcer or scarring or other significant ocular complications.

Vernal keratoconjunctivitis

This entity is a more severe form of ocular allergy. It is usually bilateral. Boys living under warm and dry climates are more commonly, though not exclusively, affected. It is also commonly associated with asthma, eczema or allergic rhinitis. Similar to allergic rhinoconjunctivitis, the disease can be seasonal or perennial. If it is seasonal, spring and summer are the peak seasons of occurrence. Actually, the word “vernal” means “in the season of spring”. The severity of the disease usually decreases when the child grows up.

Similar to other ocular allergy, itchiness, tearing, photophobia, burning sensation are the usual presenting symptoms. Sometimes the patient may have thick mucus discharge. Papillae commonly form on the upper tarsal conjunctiva. These papillae enlarge in more severe cases, giving rise to the “cobblestone” appearance, which ophthalmologists called giant papillae. Nodules with overlying white plaques may form around the circumference of the cornea, i.e. along the limbus. They are called Trantas dots. Corneal ulcers, which ophthalmologists call shield ulcer, sometimes occur, resulting in corneal scarring. “Pseudogerontoxon”, similar to arcus senilis in appearance, sometimes appears along the limbus. The corneal rigidity may also decrease in these patients, resulting in keratoconus.

The pathophysiology is more complicated than allergic conjunctivitis.3 It involves tissue remodelling, with...
eosinophils and lots of other immunomediators participating, forming the giant papillae.

**Atopic keratoconjunctivitis**

This is potentially the most serious entity among the three forms of ocular allergy. The patient usually has atopic dermatitis. The disease may not resolve with age, as vernal keratoconjunctivitis may do. Some serious complications, like keratoconus, cataract and retinal detachment are associated.

The skin of the eyelids is typically thickened, macerated and fissured. Blepharitis is a common association. Inferior conjunctiva is more commonly affected with conjunctival injection, chemosis and papillae formation. Conjunctival scarring causing symblepharon may occur in advanced cases. Corneal ulcer and scarring may also occur similar to vernal keratoconjunctivitis.

**Treatment of Allergic Conjunctivitis**

Treating ocular allergy involves a stepwise approach. Avoidance of allergens is the first step, though in many cases no specific allergen can be identified.

In the mildest case of allergic conjunctivitis, with just mild itchiness and conjunctival injection, topical antihistamine with or without mast cell stabiliser may be the only required medications. Antihistamine eyedrops like levocabastine, emedastine, antazoline, cause faster relief of symptoms than pure mast cell stabilisers like sodium cromoglycate, nedocromil, lodoxamide. Mast cell stabilisers are not effective in controlling acute exacerbations but may have some prophylactic effect and can be used as steroid sparing eyedrops. Artificial tears may wash away the allergens and relieve the symptoms a bit. Cold compress may also have some soothing effect. Systemic antihistamine, like chlorpheniramine, may be helpful when there is lid oedema or nasal symptom.

Since the pathophysiology of ocular allergy may involve other immunomediators and cellular mediators, medications combining the actions of antihistamine eyedrops and mast cell stabilisers and having other anti-inflammatory actions are developed. Examples include ketotifen and olopatadine. They have antihistamine action and the effect of mast cell stabilisers at the same time. On the other hand, they can prevent activation of neutrophils, eosinophils, macrophages and reduce the release of leukotrienes, platelet activating factors and many other factors. Because they combine the actions of antihistamine and mast cell stabilising eyedrops, patients may be able to use less medications. This can improve the compliance of the patients.

In cases refractory to the above treatment, steroid eyedrops should be considered in the next step. Steroid eyedrops might also be considered at the early stage of vernal or atopic keratoconjunctivitis particularly when there is keratopathy. Cases requiring topical steroids are best to be handled by ophthalmologists due to the potential side effects of topical steroids and patients will require careful monitoring. Topical steroid is well known to cause ocular side effects like cataract and raised intraocular pressure leading to steroid-induced glaucoma. Monitoring intraocular pressure is particularly difficult in children. Some steroid eyedrops which cause less increase in intraocular pressure have been developed. One example is 0.2% loteprednol. With treatment, the giant papillae in vernal keratoconjunctivitis may shrink in size as inflammation subsides, and they often do not disappear.

In the steroid-resistant cases some more aggressive treatment using topical immunosuppressant eyedrops may be required such as topical tacrolimus and topical cyclosporin. These eyedrops are not widely available and are reserved for recalcitrant cases.

Blepharitis associated with atopic keratoconjunctivitis should also be treated properly, like using topical antibiotics and emphasising lid hygiene. When the disease is complicated by developing corneal ulcer which is resistant to medical treatment, or if there are other ocular complications, surgical management may be required.

**Conclusions**

Ocular allergy is a very common condition which is encountered very frequently, if not daily, even in a tertiary eye centre. The mildest cases can be treated in a primary setting. If the patient is not responsive to simple treatment, or if there are complications, prompt referral to ophthalmologists will be the next step. Treating these children usually is a prolonged process which may take even years. But it is worth all the efforts if vision impairing complications can be prevented.

**References**

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