

ORIGINAL ARTICLE

Nonseasonal Allergic Conjunctivitis in the Tropics: Experience in a Tertiary Care Institution

**Harold Choi, MBBS, and
Sao Bing Lee, MBBS, FRCS**
Department of Ophthalmology,
National University Hospital,
Singapore

ABSTRACT *Purpose:* To understand the epidemiology, severity, types of pathology, clinical features, precipitating factors, and treatment outcomes of patients with allergic conjunctivitis in a tropical climate receiving corneal subspecialist intervention. A total of 33 patients with severe allergic conjunctivitis under corneal subspecialist care in National University Hospital, Singapore were studied. *Design:* A retrospective, noncomparative case series. *Main outcome measures:* epidemiological data, clinical features, complete ophthalmological examination, and treatment types. *Methods:* Both eyes of 33 patients seen at the cornea subspecialist clinic between May 2005 and July 2006 were examined at baseline, and followed up. Clinical features, treatment given, and outcome variables through case sheet review were analyzed. *Results:* Twenty-five patients (75.8%) were male, and 8 (24.2%) were female. Seventeen patients (51.5%) had concomitant allergic rhinitis, 16 patients (48.5%) had asthma, and 17 (51.5%) had associated dermatitis. Only 9 patients (27.3%) had documented precipitating factors. None of the 33 patients said that their symptoms were seasonal; 22 (66.7%) said their symptoms were perennial. Twenty-nine patients (87.9%) had punctate epithelial erosions, and 12 patients eventually progressed to have a corneal epithelial defect or shield ulcer (36.4%). Eleven out of the 33 patients (33.3%) received topical cyclosporine 0.5%. Of these, only 1 (9.1%) had documented complaints of intolerable side effects. *Conclusion:* Allergic conjunctivitis in a non-temperate, non-seasonal climate has different clinical presentations, and varied precipitating factors. The disease in such conditions may respond differently to the usual anti-allergy drug options used in temperate countries.

KEYWORDS Allergic conjunctivitis; Asian; atopic keratoconjunctivitis; corneal ulcer; corticosteroid; cyclosporine; olopatadine; perennial; restasis; seasonal; steroid-response glaucoma; tropical climate; vernal keratoconjunctivitis

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Correspondence and reprint requests to: Harold Choi, Department of Ophthalmology, National University Hospital, 5 Lower Kent Ridge Road, Main Building Level 3, Singapore 119074. E-mail: choiharold@gmail.com

Allergic conjunctivitis is a disease well recognized in general practice and in the specialist pediatric clinics, with multiple precipitating factors ranging from environmental, psychological, and genetic elements. This disease is well described in many eye institutions in countries where a seasonal climate in temperate environmental conditions predominates.^{1–6,13} Most cases of allergic or

atopic keratoconjunctivitis usually are adequately managed in a general practice setting or in a pediatric clinic, but the disease also can be associated with several serious blinding complications, such as corneal infections, necessitating strong topical anti-inflammatory drugs under corneal subspecialist supervision. This study's aim was to understand the epidemiology, severity, type of pathology, clinical features, precipitating factors, and treatment outcomes of patients with allergic conjunctivitis in a tropical climate receiving corneal subspecialist intervention.

MATERIALS AND METHODS

A total of 33 patients with severe allergic conjunctivitis under corneal subspecialist care between May 2005 to July 2006 in National University Hospital, Singapore were studied. This was done by a retrospective, noncomparative case series using case sheet reviews. All patients diagnosed with allergic conjunctivitis were included in the case series. All epidemiological data were obtained from the clinical records. Clinical symptoms were obtained via normal ophthalmological clinical consults in the eye clinic, and slit-lamp examination findings were noted in the records and subsequently used for classifying the various types of allergic conjunctivitis. The types of drugs and other treatment modalities were obtained from the case sheets as well as review of the computer database of drugs dispensed to the each patient. Precipitating factors ascertainable from each patient were obtained via history taking, RAST investigations, or skin prick testing.

RESULTS

Twenty-five patients (75.8%) were male and 8 (24.2%) were female (as illustrated in Figure 1); 20 (60.6%) were Chinese and 10 (30.3%) were Malay; Indians, Eurasians, and other races made up 1 patient (3.0%) each. The mean age of presentation was 10.7 years, and the average age of onset of symptoms was 9.3 years. The age range was from 2 to 24 years.

The patients were mainly referred from polyclinics (23 patients [69.7%]). Referrals from general practitioners (1 patient, 3.0%), from the same hospital emergency department (4 patients, 12.1%), and from other specialty departments within the same hospital (5 patients, 15.2%) formed the rest of the referring sources.

The average duration of symptoms at presentation to the ophthalmologist was 593.3 days. Of all the patients,

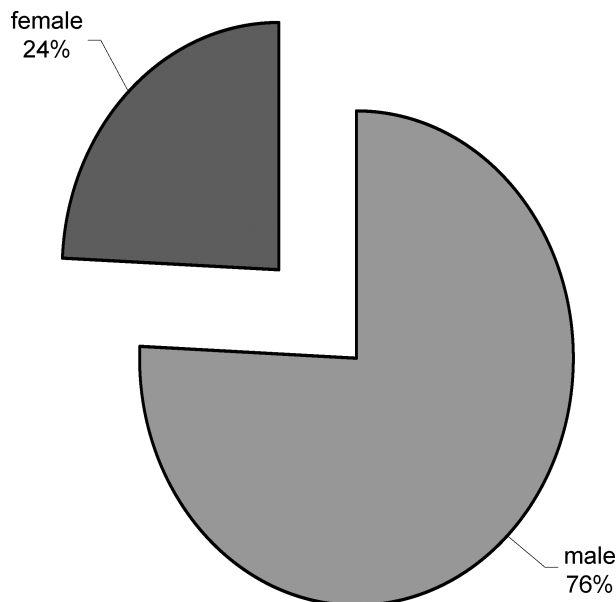


FIGURE 1 Gender distribution.

only 2 (6.1%) had drug allergies. None of the patients volunteered a family history of atopy. Seventeen patients (51.5%) had concomitant allergic rhinitis, 16 patients (48.5%) had asthma, and 17 (51.5%) had associated eczema. Only 9 patients (27.3%) had documented precipitating factors. Of these, 1 (11.1%) had allergic symptoms after taking food/drinks with coloring, 1 (11.1%) with swimming pool water, 1 (11.1%) with gun powder, 1 (11.1%) after an insect bite, 1 (11.1%) with eating eggs, 1 (11.1%) after exposure to Bermuda grass, and 1 (11.1%) was found to have allergies to cockroach. Three of these patients (33.3%) had dust mite allergies, while 2 (22.2%) had contact lens or contact lens solution allergies. None of the 33 patients said that their symptoms were seasonal; 22 (66.7%) said their symptoms were perennial.

The mean visual acuity (VA) at presentation was log-MAR -0.10 (standard deviation, range: 0.11, -0.40 to 0.00). The worst mean VA during the patients' history in the clinic was -0.27 (SD, range: 0.27, -1.30 to 0.00). The best mean VA was -0.04 (SD, range: 0.09, -0.48 to 0.00). Thirty-two patients (97.0%) had itchiness and redness, 33 patients (100%) had ocular discharge, and 20 (60.6%) had blurring of vision. The average first documented intraocular pressures for the right was 15.1 mmHg, while the left eyes had an average of 15.4 mmHg.

Objective examinations showed that 22 patients (66.7%) had papillae (nongiant), while 21 patients (63.6%) had giant papillae. Twenty-nine patients

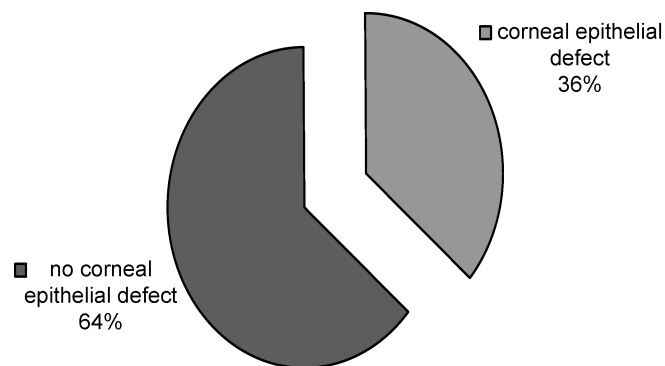


FIGURE 2 Proportion of patients with corneal complications.

(87.9%) had punctate epithelial erosions, and 12 patients eventually progressed to have a corneal epithelial defect or shield ulcer (36.4%). Figure 2 illustrates the relative proportions of patients having demonstrable corneal epithelial defects compared to those who did not. Five patients (15.2%) had trantas dots, 7 (21.2%) had limbal nodules, 2 (6.1%) had corneal plaques, and 1 (3.0%) had a pseudogerontoxon. Eleven patients (33.4%) had stromal scars, while 6 patients (18.2%) had peripheral vascularization. The condition of 4 patients (12.1%) was complicated by microbial keratitis requiring topical antibiotics.

Twenty-two patients of the 33 (66.7%) had palpebral vernal keratoconjunctivitis, while 1 patient had limbal vernal keratoconjunctivitis (3.0%). Ten patients (30.3%) had mixed palpebral and limbal vernal keratoconjunctivitis. Thirty-two patients had bilateral disease (97.0%), and 19 patients (57.6%) had bilateral equal disease. Five patients had more severe disease on the right eye (15.2%), while 4 (12.1%) had more severe disease on the left eye.

Thirty patients were treated with topical antihistamines (90.9%). Of these patients, 30 (100%) received olopatadine, and 4 (13.3%) received ketotifen. One (3.3%) was treated with pheniramine. Two patients received topical decongestants (6.1%); both used naphazoline topically. Of all the patients, 9 (27.4%) were prescribed systemic antihistamines. Of these patients, 6 (66.7%) used cetirizine, 3 (33.3%) received hydroxyzine, 2 (22.2%) used loratadine, and 1 (11.1%) was prescribed promethazine. Systemic antihistamines were prescribed by pediatricians for concomitant allergic rhinitis.

Eighteen patients used topical mast cell stabilizers (54.6%). All 18 used cromoglycate, while one of them also used lodoxamide (5.6%). One (5.6%) was treated with *N*-aspartyl acetyl glutamic acid (NAAGA). None of the 33 patients received topical NSAIDs.

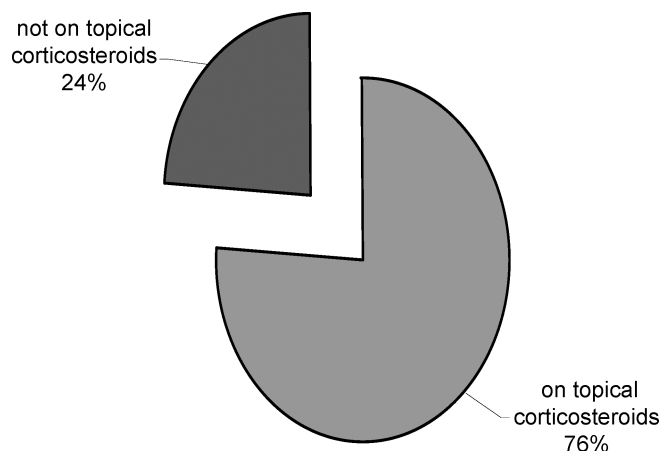


FIGURE 3 Proportion of patients with topical corticosteroids.

Figure 3 illustrates the proportion of patients receiving steroids either topically or systemically. Twenty-five patients of the cohort (75.8%) were treated with topical corticosteroids. Of these 25, 19 (76.0%) were prescribed dexamethasone, 9 (36.0%) were prescribed loteprednol, 13 (52.0%) were prescribed fluoromethalone, and 3 (12.0%) used topical prednisolone. Of the patients who received corticosteroids, 5 patients (20.0%) developed steroid-response glaucoma, and the mean highest documented intraocular pressure for these patients was 27 mmHg. One patient of the 33 (3.0%) needed systemic corticosteroids, and prednisolone was used for this purpose. A pediatrician, who was concurrently managing the patient for asthma, prescribed this.

Eleven out of the 33 patients (33.3%) were treated with topical cyclosporine 0.5%. Of these 11, only 1 (9.1%) had documented complaints of intolerable side effects (stinging sensation after putting eyedrops), and discontinued treatment due to side effects. Nine of these patients had documented improvement in both signs and symptoms with topical cyclosporine (81.8%). The mean time for improvement with topical cyclosporine was 2.9 weeks, and the mean duration of therapy with topical cyclosporine was 16 weeks. Figure 4 summarizes the topical medication and the number of patients using medications during the study period.

Of the whole case series, only 1 patient (3.0%) underwent ocular surgery (Hotz procedure). One patient (3.0%) had bandage contact lens (3.0%), and 1 patient (3.0%) received supratarsal corticosteroids, where triamcinolone was injected. Seven patients (21.2%) were referred to the immunologist/pediatrician. Four patients (12.1%) had skin prick tests performed, and 1 patient

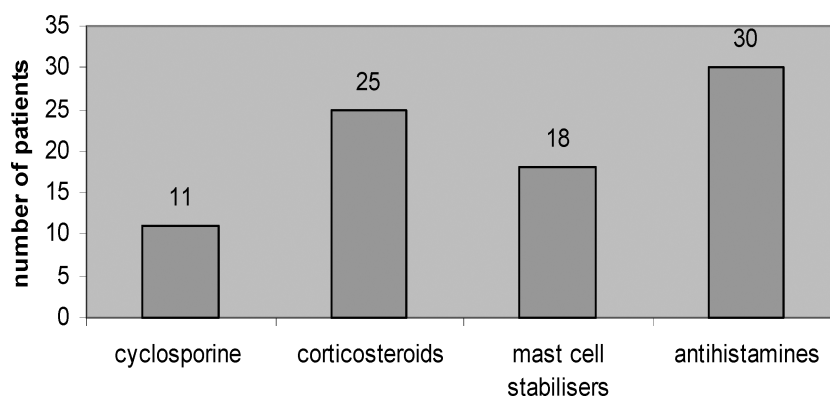


FIGURE 4 Treatment modalities.

(3.0%) had inhalant or RAST test done. Of those who had these immunological tests, all 5 (100.0%) were allergic to dust mites, 1 (20.0%) was allergic to Bermuda grass, 2 (40.0%) were allergic to cockroach, 1 (20.0%) was found to have egg allergy, and 1 (20.0%) had seafood allergy. None of the 33 patients had any immunotherapy. One patient (3.0%) sought homeopathic treatment using flower extract.

Twenty-two patients had other ocular pathology besides allergic conjunctivitis (66.7%). One patient (3.0%) had cataracts, 6 (18.2%) had blepharitis, 2 patients (6.1%) had cicatrizing conjunctivitis, and 4 patients (12.1%) had chalazia/meibomitis. Ten patients (30.3%) had astigmatism, 10 patients (30.3%) had hypermetropia, and 8 patients (24.2%) were myopic. One patient (3.0%) had dry eyes, 1 patient (3.0%) had exophoria, 1 patient (3.0%) had non-corticosteroid-induced glaucoma, and 1 patient (3.0%) had marginal keratitis. Three of the 33 (9.1%) had epiblepharon. None of the 33 patients had keratoconus, keratoglobus, pellucid marginal degeneration, or retinal detachment.

Of the case series, 2 patients were discharged from ophthalmological care (6.1%). The mean age of discharge or resolution was 13 years of age.

DISCUSSION

Most of the patients suffering from allergic conjunctivitis in this study were young males, around the age of 10.7 years. This correlates well with the typical profile of a pediatric patient seeking medical attention for allergic rhinitis and asthma.¹⁴ The majority of the allergic conjunctivitis seen was associated with rhinosinusitis and/or asthma. There is a suggestion of a common clinico-pathological mechanism associated with these disease entities. The type of allergic ocular disease seen here seemed to be largely nonseasonal, with 22 patients

(66.7%) having perennial allergic conjunctivitis. With no cyclical change in weather in Singapore, this may be due to environmental conditions causing constant symptoms. The majority of patients did not have any documented precipitating factors. Most of the disease type is the palpebral conjunctivitis rather than the limbal form.

Despite how common allergic conjunctivitis is in the population, with most having manageable symptoms, a fair proportion of patients seen here had severe corneal pathology with potentially severe vision-threatening disease.⁹ Twenty-seven patients (87.9%) had some corneal involvement, be it punctate epithelial erosions, corneal epithelial defects, or corneal ulcers.⁹ Some patients had permanent sequelae of disease, with 33 (33.3%) of patients having stromal scarring, and 4 patients (12.1%) having microbial keratitis. This may justify why despite this disease being largely community-based and managed by general practitioners, a fair proportion of patients were referred from the emergency room for urgent ophthalmological opinion (12.1%).

Comparing treatment options, the drugs used most were topical antihistamines, topical corticosteroids, topical mast cell inhibitors, and topical cyclosporine,^{1,7} in order of decreasing frequency. Among the topical antihistamines, olopatadine was the most used. Cromoglycate was the overwhelming favorite mast cell stabilizer used.¹⁸ A large proportion (76.0%) was treated with topical corticosteroids to control the disease. This is not surprising, as these patients were not well controlled on topical antihistamines alone and required referral to the cornea specialist. Among the topical corticosteroids, dexamethasone and fluoromethalone were most widely used. Most of the patients also received corticosteroids for prolonged durations, and as such 20.0% developed raised intraocular pressure,^{16,17} comparable

to other reports of about 12.5% corticosteroid-induced glaucoma rate.²¹ To reduce the use of corticosteroids, a significant proportion of patients (33.3%) received topical cyclosporine. Topical decongestants, topical nonsteroidal anti-inflammatory drugs, and systemic antihistamines proved unpopular among the cornea specialists in treating allergic conjunctivitis. None of the patients were given immunotherapy treatment⁸ or supratarsal corticosteroid injections.¹⁰ Very few patients were fit for discharge during the period of study, which may be due to the chronicity of the disease.² The patients were also seen in a tertiary eye care setting, where patients tend to have more severe and chronic disease.

Almost 75% of patients received topical corticosteroids, which is comparable to previous studies in the west where topical corticosteroids were used on 85% of patients.²⁰ This is not unexpected as most patients receiving specialist corneal attention for atopic keratoconjunctivitis are at the more severe end of the spectrum of disease severity. None of the patients received systemic cyclosporine, unlike at some centers, which may have used it therapeutically with good effect.²

CONCLUSION

The description of this case series aims to provide practitioners with an overview of the practice pattern, modalities used, typical patient epidemiology, and clinical course for better management of allergic conjunctivitis in a country with a nonseasonal tropical climate.

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