ORIGINAL ARTICLE

The clinical presentation and frequency of ocular complications associated with vernal keratoconjunctivitis

Sharjeel Sultan, Uzma Taqi, Safdar Zamir Rizvi, Tahir Ahmed

Abstract

Objective: The objective of this study was to determine the clinical presentation and frequency of ocular complications associated with vernal keratoconjunctivitis (VKC).

Design: Cross-sectional study.

Setting and duration: The study was conducted at the Ophthalmology Department of Jinnah Postgraduate Medical Center (JPMC), Karachi from May 2009 to October 2009.

Methodology: Fifty patients with signs and symptoms of vernal keratoconjunctivitis were enrolled in this study. Clinical signs and symptoms and ocular complications of these patients were observed for up to 6 month.

Results: A total of fifty patients were examined and evaluated (n=50). Of these, 28 patients (56%) came in the first decade of life. 46 patients (92%) were males. 16 patients (32%) had family history of atopy. Study showed that palpebral vernal keratoconjunctivitis was the most common clinical form present in 29 patients (58%), followed by mixed vernal keratoconjunctivitis in 13 patients (26%) and limbal vernal keratoconjunctivitis in 9 patients (18%).

The symptoms and signs of the disease were present all around the year in 64% of the patients and in summer the severity of the disease increased. Steroid induced glaucoma 05(10%), cataract 02(4%), keratoconus 04(8%), and corneal scarring 03(6%) were frequent complications of VKC.

Conclusion: Vernal keratoconjunctivitis is an allergic disorder affecting the children, more common in males than females. It is not a rare disease in Pakistan, and the severe form of vernal keratoconjunctivitis is a potentially blinding disease and carries significant societal costs. There is a need to assess disease severity in order to develop standardized therapeutic guidelines based on the stage of vernal keratoconjunctivitis. Visual loss may be due to keratoconus and corneal scars, as well as complications of the unsupervised use of topically administered steroids.

Keywords: Allergic conjunctivitis, Vernal Keratoconjunctivitis, spring catarrh.

Liaquat College of Medicine and Dentistry, Darul Sehat Hospital, Karachi
S Sultan

Baqai Medical University, Karachi
U Taqi

Hamdard University Hospital, Karachi
SZ Rizvi
T Ahmed

Correspondence:
Dr Sharjeel Sultan
B-28/2, Block 13, Gulistan e Jauhar, Karachi
0321 2393133
sharj35@yahoo.com

Introduction:

The eye is a frequent target of inflammation in both local and systemic allergic reactions. the vast majority of ocular allergy affects the conjunctiva. Vernal keratoconjunctivitis is a severe form of ocular allergic conjunctivitis causing disturbance of normal activities at school or work due to severe itching, grittiness, foreign body sensation, difficulty in opening the eyelids, photophobia and copious mucous discharge[1].

Vernal keratoconjunctivitis is a chronic condition, causing bilateral recurrent inflammation of the conjunctiva and cornea typically occurs in males before the age of 10 in 80% of cases, it lasts 2–10 years, and it usually resolves during puberty. Males have an earlier presentation of symptoms than females and the male to female ratio decreases with age[2].

Vernal keratoconjunctivitis is more prevalent

in hot and dry areas (mediterranean basin, the Middle East, Africa and the Indian subcontinent). It is relatively unusual in most of North America and western europe[3]. Risk factors include age, underlying atopic predisposition, extent of allergen exposure and individual immune response to antigenic stimulation. There is a significant history of other atopic manifestations such as eczema or asthma in patients with vernal keratoconjunctivitis [4]. A family history of atopy is found in these patients.

Three clinical types of vernal keratoconjunctivitis are recognized, limbal type (fine papillae with circumferential gelatinous limbal infiltration and horner-trantas dots); the palpebral type (giant papillae of >1 mm in diameter on the superior tarsal conjunctiva) and a mixed type. These features leave no doubt as to the diagnosis of vernal keratoconjunctivitis. The reasons underlying the development of the various types of vernal keratoconjunctivitis in these patients are not understood[5].

The main symptoms are itching; redness and foreign body sensation; lacrimation; photophobia; blepharospasm and pseudo-ptosis due to palpebral thickening are highly specific symptoms of vernal keratoconjunctivitis. These symptoms if not treated appropriately can persist for weeks[6]. Seasonal exacerbation is common, but patients may have symptoms year-round especially those living in subtropical or desert climates. More than 60% of patients have repeated recurrences all year round (seasonal variation) and this led to the widely accepted hypothesis that vernal keratoconjunctivitis is an immunologically mediated hypersensitivity reaction to environmental antigens[7].

The signs include papillary response of the conjunctiva, principally of the limbus or upper tarsus; thick, abundant and ropy mucus; trantas dots and "cobblestone papillae". Keratitis (which occurs in up to 50% of cases)[8] and shield ulcers are sight-threatening complications. There is an association of keratoconus in vernal keratoconjunctivitis patients[9]. Other risks are of cataract and glaucoma due to the steroids. Vernal keratoconjunctivitis may cause significant complications and lead to loss of vision[3,11].

The purpose of this study was to assess the presentation and ocular complications of Vernal Keratoconjunctivitis. Early diagnosis of the disease can help timely management and prevent complications.

P**urpose of study:**
This study is being done to know about the ocular complications associated with Vernal Keratoconjunctivitis. Early diagnosis of the disease can help management timely and prevent complications.

Materials and methods:
This is a hospital based Cross-sectional study that was conducted at the Ophthalmology Department of Jinnah postgraduate medical center Karachi from May 2009 to October 2009 in order to determine the clinical presentation and ocular complications associated with vernal keratoconjunctivitis. Patients of either sex between 5-20 years of age, having signs and symptoms of VKC were included and patients with a previous history of keratitis ,any history of dellen, degeneration, corneal melting, ocular trauma.and patients refusing consent.were excluded. 100 eyes (including right, left or bilateral) were selected among the patients who presented with the signs and symptoms of vernal keratoconjunctivitis. It was non probability purposive sampling. Sample size calculation was done as it was a hospital based study and duration of the study was fixed.

Data collection procedure:
Patients were selected from Out Patient Department of Ophthalmology, Jinnah postgraduate medical center Karachi according to inclusion criteria.

Informed written consent was taken. A total of fifty Patients were registered for the study who were diagnosed as having vernal keratoconjunctivitis by clinical and diagnostic procedures.

Diagnosis of vernal keratoconjunctivitis was

based on typical symptoms like itching, watering, photophobia. Careful history was taken from each patient. Severity of the symptoms was evaluated as itching was mild when Patient complained of itching in eyes sometimes, moderate when Patient complained of rubbing the eyes sometime., severe when patient rubbed the eyes most of the time. Photophobia was mild when in bright sunlight patient felt difficulty in opening the eyes. Moderate when in every bright light patient tried to close the eyes. Severe when patient did not open the eyes even in the light of a torch.Sticky mucus discharge was mild when patient complained of watering and mucus discharge sometimes. Moderate when thick mucus discharge sometimes. Severe when patient complained of thick ropy discharge most of the times.

Complete ocular examination was done which included Visual acuity with the help of snellens chart, Slit lamp biomicroscopy examination for signs especially Upper tarsal conjunctiva for papillae, Limbus for Trantas dots and thickening of the conjunctiva, Cornea with flourecein for shield ulcer when indicated. Papillae on tarsal conjunctiva or at the corneoscleral limbus were evaluated and graded as:

0: No papillary reaction
1+: Few papillae < 0.2mm widespread over the tarsal conjunctiva or around the limbus
2+: Papillae of 0.3 to 1 mm over the tarsal conjunctiva or at the limbus
3+: Papillae of 1 to 3 mm all over the tarsal conjunctiva or for 360 degree around the limbus
4+: Papillae > 3 mm in the tarsal conjunctiva or a gelatinous appearance at the limbus covering the peripheral cornea.

The presence of a corneal epitheloipathy or corneal ulcer or plaques was also evaluated and recorded. Applanation tonometry to check the intraocular pressur., placido disk for oil droplet sign of keratoconous , Direct ophthalmoscope to check the fundus for glaucomatous optic disc cupping .

Research tools were Proforma ,Slit lamp, Flourescein strips, Applanation Tonometer, Direct ophthalmoscope.

Data was analyzed descriptively and presented with the help of percentage and proportion. No statistical test was required, as this was a descriptive study.

Results:

Study design was descriptive and sample technique was non probability convenience. Vernal keratoconjunctivitis is a chronic disease. All patients came from the rural areas of Karachi to the Jinnah post graduate medical center .Most of the patients presented with the signs and symptoms of the disease in the first decade of life i.e. 28 (56%). (Table 1).There were 45 males (90%) and 5 females (10%) (Table 1).

A family history of atopy was present in 16 (32%) patients. Vernal keratoconjunctivitis was only manifestation in 34 (68%) patients (table 2). Patients who claimed to have several relapses of the diseases all around the year were 32 (64%) and those only in summer were 17 (34%) and only 1 (2%) in spring (table 2).the disease was bilateral in 49 (98%)(table 3).

Clinical types of the disease in order of frequency were palpebral vernal keratoconjunctivitis in 29 (58%) patients, limbal vernal keratoconjunctivitis in 08 (16%) patients, mixed vernal keratoconjunctivitis in 13 (26%) patients (Table 3). Symptoms like itching, photophobia, sticky mucus discharge and tearing were the most common among all the patients (Table 4).

The papillae were present in all the patients, which were mostly located on the upper tarsal conjunctiva, followed by bulbar and limbus. Gi-

Table 1: *Age and sex distribution of the patients with vernal keratoconjunctivitis*

	Number of Patients (%)
Age	
5 To 10 Years	28 (56%)
10 To 20 Years	22(44%)
Sex	
Male	45(90%)
Female	5(10%)

Table 2: *Patients with family history of atopy and seasonal occurrence of vernal keratoconjunctivitis*

	Number of Patients (%)
Family History of Atopy	
Positive	16 (32%)
Negative	34 (68%)
Clinical Presentation	
Perinnial	32 (64%)
Only In Summer	17 (34%)
Only In Spiring	01 (2%)

ant cobblestone like papillae were observed in 13 (26%) patients. Horner-trantas dots were present in 09 (18%) patients , Superficial keratopathy like superficial punctate keratitis was present in 12 (24%) patients (Table 4).

Associated diseases like cataract was present in 1 (2%) patients, glaucoma was present in 05 (10%) patients, Keratoconus was present in only 1 (2%) patient (Figure 1).

Discussion:

This was a descriptive study in which different clinical data were compared to determine the ocular complications associated with vernal keratoconjunctivitis in patients who came to the Ophthalmology Department at Jinnah Post-Graduate Medical Centre, Karachi.

The data of the study showed that most of the

Table 4: *Patients with family history of atopy and seasonal occurrence of vernal keratoconjunctivitis*

	Number of Patients (%)
Signs	
Papillae	50 (100%)
Cobblestones	13 (26%
Horner-Trantas Dots	09 (18%)
Superficial Keratopathy	12 (24%)
Shield Ulcer	05 (10%)
Corneal scarring	03 (6%)
Irregular Astigmatism	03 (6%)
Symptoms	
Itching	50 (100%)
Photophobia	08 (16%)
Sticky Mucus Discharge	42 (84%)
Blurred Vision	04 (08%)
Burning	05 (10%)

Table 3: *types and laterality in patients of vernal keratoconjunctivitis*

	Number of Patients (%)
Clinical Type	
Palpebral Vernal Keratoconjunctivitis	29 (58%)
Limbal Vernal Keratoconjunctivitis	08 (16%)
Mixed Vernal Keratoconjunctivitis	13 (26%)
Laterality	
Bilateral	49 (98%)
Unilateral	01 (02%)

patients presented with vernal keratoconjunctivitis in their first decade of life i.e. from 5-10 years of age i.e.28 (56%) and affecting most commonly the boys i.e. 45 (90%). This is comparable to the study done in Pakistan in which 88% male presented in their early years[11] and abroad which showed also similar male preponderance (90%) in this disease[12].

There are three clinical forms of the disease. Our study showed that most common clinical form found was Palpebral type observed in 29 (58%) followed by Mixed 13 patients (26%) and Limbal 8 patients (16%). These results are similar to other studies done in Pakistan in which patients came with Palpebral form 56%. The difference was observed in other two types of the disease in which there was Limbal type of 4% and Mixed 40%[13].

Patients presented with the history of atopy were 16 (32%) showing no significant association that is supported by the study by Khan et al, which shows 39% of their patients having family history of atopy. The first interesting finding

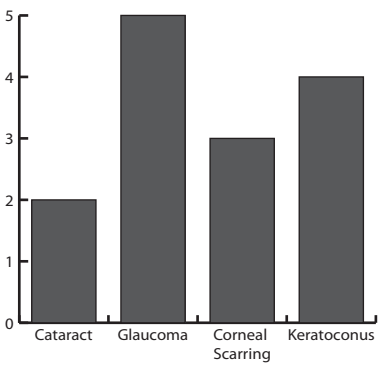

Figure 1: *Associated diseases with vernal keratoconjuntivitis*

around the nomenclature of the disease "Vernal" which does not appear to appropriately describe the course of the disease in a significant number of percentage of patients. 32 (64%) patients had experienced perennial nature of the disease that aggravates in summer in 17 (34%) patients. This observation is in agreement with Bonini et al[14] and disagreement with Khan [15].

The patients presented with typical signs and symptoms like Itching, photophobia, sticky mucus discharge, foreign body sensation which render the diagnosis of vernal keratoconjunctivitis fairly straightforward. In our study these were the most frequently reported sustained symptoms observed. Variable data is available regarding the clinical signs of the disease. Papillae were observed in almost all cases of vernal keratoconjunctivitis most commonly on upper tarsal conjunctiva. horner-trantas dots in 09 (18%), superficial punctate keratopathy was found to be the most common corneal complication of vernal keratoconjunctivitis. associated diseases like cataract (04%), glaucoma 05 (10%) and keratoconus 03 (6%) were observed. These data are comparable with the study done in Italy[14] and Pakistan[11] . Therapy for mild vernal keratoconjunctivitis includes preservative-free artificial tears, cold compresses and antihistamines. Treatment in severe cases of vernal keratoconjunctivitis is still problematic due to frequent exacerbations. Topical corticosteroids are usually given only for a short period of time to avoid the risk of side effects including glaucoma, cataract and infection[5]. Unfortunately patients and their relatives keep seeing more than one doctor looking for cure from the disease and this leads to the prolonged unsupervised use of steroid drops and increasing the risk of complications.

In summary several clinical findings observed from this study such as typical male pattern and its presentation in early life which diminished after puberty. It was observed that it is not a seasonal disease and Palpebral was the most common form.

Limitations of this study are: there were no immunological diagnostic tests done to this group of patients because of limitations in the facilities available in our hospital. History of other associated allergic diseases and family history of allergic diseases were not documented in this study. Also patients were not grouped to those who come from desert areas or the mountains to study the differences in presentations and ocular complications

Conclusions:

Vernal keratoconjunctivitis is not a rare disease in Pakistan, and the severe form of vernal keratoconjunctivitis is a potentially blinding disease and carries significant societal costs. There is a need to a disease severity grading in order to develop standardized therapeutic guidelines based on the stage of vernal keratoconjunctivitis. Visual loss may be due to keratoconus and corneal scars, as well as complications of the unsupervised use of topically administered steroids.

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