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Original Research Article

Clinical and demographic profile of vernal keratoconjunctivitis at a tertiary eye care hospital in national capital region of India

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ABSTRACT

Purpose: To study the clinical and demographic profile of patients with vernal keratoconjunctivitis (VKC) at a tertiary eye care center in NCR of India.
Materials and Methods: A total of 92 patients with active VKC, were included in the study. Age, gender, personal and family allergies, presenting symptoms, duration of disease, complete ocular examination and complications were recorded.
Results: The Mean age at presentation was 9 years with male to female ratio of 3.4:1.
Majority of the patients had mixed pattern disease (72.8%). Chronic perennial disease was seen in 44% patients. Personal or family history of allergies was noted in 9.8% patients. Moderate to severe vision loss was seen in 8.7% of cases. The commonest complication was peripheral corneal neovascularisation in 7.6% patients.
Conclusion: VKC is the disease of childhood, and males are more commonly affected. In this region, mixed type and with perennial disease is the most common form.

1. Introduction

Vernal keratoconjunctivitis (VKC) is a chronic, bilateral, at times asymmetrical, seasonally exacerbated, allergic inflammation of the ocular surface, involving tarsal and / or bulbar conjunctiva.VKC more commonly affects young, male patients.[1,2] in the first decade of life around the age of 7 years. The male:female ratio observed is 2.3:1.[3]

VKC is seen more commonly in the regions with hot, humid climate, and with higher load of airborne allergens. It is a common ocular surface disorder in India, and South America, Mediterranean region and central Africa.[4–8] Clinically, it is characterized by presence of papillary hypertrophy of the palpebral and/or the limbal conjunctiva, bulbar conjunctival pigmentation, limbal thickening, Horner Trantas dots, and mucous discharge**.** The clinical profile of this disease seems to have geographical variations.[2–8] However, there are no major series explaining the demographic and clinical pattern of VKC from this part of the world. Knowledge of clinical profile of the disease in the local population will help in designing preventive measures and also proper management of the disease. The present study was conducted to describe clinical and demographic profile of VKC from a tertiary care hospital in national capital region (NCR), India.

2. Materials and Methods

A total of 92 patients were enrolled in the study. All the patients had active VKC on enrolment. Diagnosis of VKC

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was made clinically according to the commonly accepted criteria. The study was approved by our institutional review board and was fully compliant with the principles of the Helsinki Declaration. The following data were recorded: Age, gender, personal and family allergies, age of onset of the disease, presenting symptoms, duration of disease, and complete ocular examination including slit lamp examination, visual acuity assessment with Snellen's chart, intraocular pressure measurement, fundus examination and complications, after obtaining informed consent from patients and their parents. The palpebral form of VKC included patients with conjunctival papillae of >1 mm on the upper tarsal conjunctiva with no limbal infiltration. The limbal form consisted of papillae of <1 mm on the upper tarsal conjunctiva with limbal infiltration with or without Tranta dots, and mixed form had features of both palpebral and limbal types of VKC.

Patients were treated with topical steroids in the form of either loteprednoletabonate 0.5% or fluorometholone 0.1%. Subjective and objective assessments of the signs and symptoms of vernal keratoconjunctivitis were done using standard scoring methodologies by Bleik et. al.[9]

3. Results

A total of 92 patients of VKC were included in the study. The mean age at presentation was 9.3 years ± 3.26 years. The minimum age at presentation was 3 years and maximum age was 16 years. There were 71 (77.2%) males and 21 (22.8%) females. The male (M) to female (F) ratio was 3.4:1. The male to female ratio increased with age and was 6.7:1 in patients aged >14 years. The average period between the initial onset of symptoms and presentation to this institute was 15 ± 23 months (Mean ± SD). Patients who had their first episode at or after 15 years of age were categorized as late onset VKC. Six patients (6.5%) were aged ≥15 years at the time of presentation, of which 2 (1 male, 1 female) patients had a late onset of disease, while the rest four had primarily an early onset disease that continued beyond 15 years of age (Table 1).

The common reported symptoms were itching (95%) followed by watering (82%). The commonest signs were palpebral conjunctival papillae (87%) and limbal infiltrate (65%). Bulbar conjunctival hyperaemia was present in 31 (34%) patients. Isolated limbal form of VKC was present in 10 patients (10.9%), while isolated palpebral form was seen in 15 patients (16.3%). The majority (67; 72.8%) of patients had a mixed form of disease with involvement of both limbal and palpebral areas (Table 2).

In the present series, 9 patients (9.8%) had either a positive family or personal history of atopy or allergic disorders, of which 2 had positive family history and 7 had a personal history of allergic diseases that included respiratory tract related allergies in 5 and allergic dermatitis in 2 patients.

At presentation, We had 84 (91.3%) patients with visual acuity ranging between 20/20 to 20/50 (grade A: Mild visual loss), 6 (6.5%) patients with visual acuity ranging between 20/50 to 20/200 (grade B: Moderate visual loss), and 2 (2.2%) patients with visual acuity of 20/200 or less in the worse eye (grade C: Severe visual loss) (Table 3).

The total subjective symptom score (TSSS) at presentation was 8.85 ±2.95 (Bleik et al grading of symptoms).[9] At final follow up (4 week) TSSS was 1.75 ±0.75. The total objective ocular sign score (TOSS) at presentation was 6.1 ±2.63 and at 4 week it improved to 1.85±1. Improvement in signs ($p<0.05$) and symptoms (0.001) at final follow up was statistically significant.

The different ocular complications due to VKC seen in our series are described inTable 4. The commonest complication was peripheral corneal neovascularization, which was present in 7 patients (7.6%). Corneal scarring was seen in 6 (6.5%) patients. Clinically limbal stem cell deficiency (LSCD) (corneal neovascularization along with conjunctivalization and corneal scarring) was seen in 2.2% of patients. Corticosteroid induced complications like cataract and glaucoma were seen in 3.3% and 1.1% of patients, respectively.

All patients were treated with topical corticosteroids i.e. loteprednoletabonate 0.5% or fluorometholone 0.1% in the active stage of disease.

Table 1: Age and sex distribution

Age group (years)	Number of cases (%)
< 5	4
5-10	54
11-14	28
15-20	6
Gender	
Male	71 (77.2%)
Female	21 (22.8%)

Table 2: Type of VKC in Study Population

Disease pattern	Number of cases (%)
Palpebral	15 (16.3%).
Limbal	10 (10.9%)
Mixed	67 (72.8%)

Table 3: Visual status of vernalkeratoconjunctivitis patients at presentation

Category	Visual acuity	Number (%)
A	20/20 to 20/50	84 (91.3%)
B	20/50 to 20/200	6 (6.5%)
C	20/200 or less	2 (2.2%)

Table 4: Complications in vernal keratoconjunctivitis

Complications	Number of patients (%)
Total no. of patients	92
Peripheral corneal neovascularization	7 (7.6%)
Corneal scarring	6 (6.5%)
limbal stem cell deficiency	2 (2.2%)
Cataract	3 (3.3 %)
Glaucoma	1 (1.1%)
Acquired ptosis	4 (4.3 %)

4. Discussion

Our study showed that VKC in the NCR, India is essentially similar to the pattern described in other tropical countries. The most common subtype is mixed form of VKC with significant number of patients having perennial disease.

Vernal keratoconjunctivitis is believed to be a disease of young and adolescents occurring most frequently between six to twenty years of age.[9] In our study, the mean age at presentation was 9 years and majority that is 95.7% patients were between age of 5 and 16 years. This is in agreement with the study by Kumar et al which showed that the majority of VKC occurs in patients between the ages of 5-25 years. In our series the youngest patient was 3 years old. There are reports of patients as young as 5-months-old in literature.[10] Leonardi et al.,[4] and Shafiq et al.,[11] reported 4% and 6% of patients with VKC above the age of 20 years respectively. In contrast to these reports, our study showed none of the patients above 20 years of old however, six patients (6.5%) were aged ≥15 years, categorized as late onset VKC.

The study included 71 males (77%) and 21 females (23 %) with M:F ratio of 3.4:1. This is similar to M:F ratio between 3.3 and 3.5 by Leonardi and co-workers in two separate observation including data from a multi-centric study from Italy.[4,5] All other series have also reported M: F ratio between 4:1 and 2:1.[6,8] Male preponderance of VKC observed in our study (77%) is similar to global pattern of male predisposition of VKC. However an isolated study from Nigeria reported a female preponderance[7] with M:F ratio of 1:1.3.

The highest numbers of patients were seen in the period of May-June, which corresponds to the warm and dry weather in the NCR part of India. Although, VKC has seasonal exacerbations; chronic perennial form has been described in literature. Tuft et al. in their study,[12] noted that VKC in tropical countries exhibits greater number of cases with chronic perennial disease and also lesser association with atopy. Similar to this observation, we noted that 44% of our patients exhibited chronic perennial disease and only 9.8% of patients had positive personal or family history of allergies. However, this is in contrast to the observation by Lambiase et al., and Bonini et al in the temperate zones. They found greater association with systemic allergies (41.5-48.7% patients).[5,13]

In the present study, most of the cases were of mixed variety (72.8%) followed by palpebral (16.3%) and limbal variety (10.9%). Study done in Ethiopia also showed similar results with

81.4% of mixed form of VKC.[14] Alemayehu et al[15] also found more than half (53.1%) of VKC patients had mixed form of VKC, followed by palpebral (43.8%). Another study done in southern India had also shown mixed type as most common variety of VKC (40.80%).[16] In contrast, the multi centric study from Italy reported majority (53.8%) of limbal presentation,[5] whereas Ukponmwan reported 82.6% cases with palpebral presentation in Nigeria.[7] Also, Vajpayee et al[17] reported bulbar variety as most common (75%) form of VKC. Even though, it was not clear why some forms of VKC are common in some area while others not, these discrepancies might probably be due to different climatic and genetic factors.

VKC can lead to various ocular complications resulting in reduced vision.[18] Bonini et al.,[13] noted permanent visual loss in 6% of patients. We also noted moderate to severe vision loss in 8.7% of our patients, of which 2.2% had visual acuity <20/200. Corneal scaring was noted in 6.5% of patients. In our series, peripheral corneal neovascularization was seen in 7.6% of patients. Peripheral corneal neovascularization has been reported by other series, although the magnitude is not reported.[7,13] Corticosteroid-induced cataract was seen in 3 patients (3.3%), while glaucoma affected 1 patient (1.1%). Bonini et al.,[13] described corticosteroid-induced glaucoma in 2.1% of patients in their series with no incidence of cataract. Higher incidence of corticosteroid-induced complications in our study may be a reflection of severe disease requiring frequent topical corticosteroid eye drops to treat the inflammation or due to inappropriate long-term use of corticosteroid eye drops by the patients.

5. Conclusion

This study has shown that VKC in this part is essentially similar to the typical pattern of VKC seen in other tropical countries. VKC is the disease of childhood, and males are more affected. In NCR part of our country, mixed type is the most common form of the disease. Higher incidence of corticosteroid-induced cataract and glaucoma are reported in our study, which warrants proper patient and parent counseling about the recurrent nature of the disease and harmful side effects of injudicious prolonged use of corticosteroids.

6. Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

7. Source of Funding

None.

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