



Original Research Article

Epidemiology of vernal keratoconjunctivitis at a tertiary eye care centre in south India

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ABSTRACT

Background: Vernal keratoconjunctivitis (VKC) is a chronic, allergic inflammation of the tarsal and / or bulbar conjunctiva, that has a varied demographic profile.

This study was conducted to know prevalence and presentation of VKC at tertiary eye care centre in South India.

Materials and Methods: A cross-sectional study of VKC patients attending the cornea clinic in a tertiary eye care centre in Karnataka, south India from September 2018 to August 2020. Detailed history, ocular examination and corneal topography with pentacam of all the patients with VKC was done. Treatment protocol was followed as per disease severity.**Results:** Out of 1684 patients, 1028 (61.05%) cases were male and 656 (38.95%) were female. Mean age of presentation was 7.1±4.2 years. Chronic perennial disease was seen in 960 cases (57%). According to disease severity index most cases n= 863 (51.25%) presented with moderate VKC. Personal or family history of associated allergy or atopy was documented in 286 (17%) patients. Keratoconus was the most common complication associated with VKC n=243 (14.42%). The major sight threatening complication causing blinding disease was shield ulcer n=21(1.24%).**Conclusion:** In our study, chronic perennial form of VKC was more common in tropical savanna kind of climate in south India. Keratoconus was a significant association with VKC that can be detected early by screening with pentacam. However, association of VKC with allergy or atopy was less significant in this study.This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.For reprints contact: reprint@ipinnovative.com

1. Introduction

Vernal kerato conjunctivitis (VKC) is a chronic, bilateral, asymmetrical, seasonally exacerbated, allergic inflammation of the ocular surface, involving tarsal and / or bulbar conjunctiva.¹ The disease has a slight male gender preponderance. Onset of the disease is usually below ten years of age and it tends to resolve during late puberty. The profile of VKC have several geographical variations.^{2–6} Dry

hot climate is a major demographic factor as the disease is unusual in north America and western Europe and more common in the Indian subcontinent, western Africa, South America and the middle east.^{6,7} Seasonal exacerbations are commoner in temperate climate, in tropical climate chronic perennial form is more common.⁷

Immunoglobulin E and cell mediated immunity play a major role in the pathogenesis. Ocular surface inflammation cause a variety of symptoms such as itching, irritation, redness, watering, photophobia, of which itching is the most

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prominent symptom that leads to habit of eye rubbing.⁷ White ropy discharge which is a thick mucus hypersecretion with sticky mucous filaments is characteristically noted in the disease.^{1,8} The diagnosis of VKC is mainly based on history and physical findings. VKC can be divided into three forms, palpebral, limbal and mixed (both limbal and palpebral) based on the anatomical location of involvement. Signs of the disease majorly involves the conjunctiva and the cornea. Conjunctiva primarily develops a papillary response usually at the upper tarsal and limbal area. The papillae tend to be discrete and flat topped in the tarsus and more gelatinous and confluent at the limbus. Limbal Horner trantas spots may be found which are a collection of eosinophils and epithelial cells.⁶ Corneal findings may range from neovascularization to epithelial erosion to sight threatening shield ulcers. VKC is associated with a varied range of complications of which keratoconus (KC) has become increasingly common due to excessive eye rubbing.⁹⁻¹¹ Early diagnosis and management of KC can be done with latest corneal topography with 3-D analysis such as the Pentacam. Pentacam is based on Scheimpflug imaging and captures 50 scans in two seconds, some essential parameters acquired are pachymetry, anterior and posterior corneal contour; the latter is affected in early KC thus playing an important role in early screening and detection.¹²

The chronic nature of the disease attributes to ocular remodelling and damage to the ocular surface leading to various complications, some of which cause serious visual morbidity.¹³ Thus the purpose was to study the demographic and clinical profile of VKC in tropical savanna climate of South India.

2. Materials and Methods

A cross-sectional study of 1684 VKC patients presenting to the cornea clinic of a tertiary eye care centre in Karnataka, south India was undertaken from September 2018 to August 2020. The study followed the tenets of declaration of Helsinki, informed consent was taken in all cases from legal guardian / patients as per age criteria. In all cases with clinical diagnosis of VKC, demographic data, complete history that included age of onset and duration of symptoms, personal and family history of eye allergies, respiratory and skin disease. Examination included slitlamp examination, fundus evaluation and intra ocular pressure (IOP) measurement. Corneal topography with pentacam analysis was done for all cases with clinical diagnosis of VKC, as a screening test to rule out keratoconus. Those excluded from the study were cases that did not give consent.

Among the outpatient population, cases were diagnosed with VKC based on symptoms and clinical findings. Patients were broadly classified into those with seasonal and chronic perennial form of disease. Classification based on severity

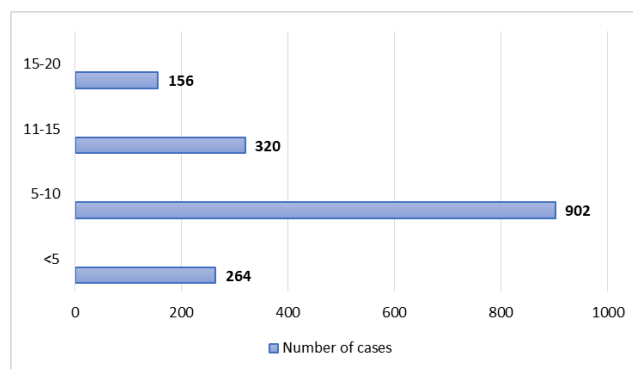


Fig. 1: Age(in years) distribution of patients presenting with VKC

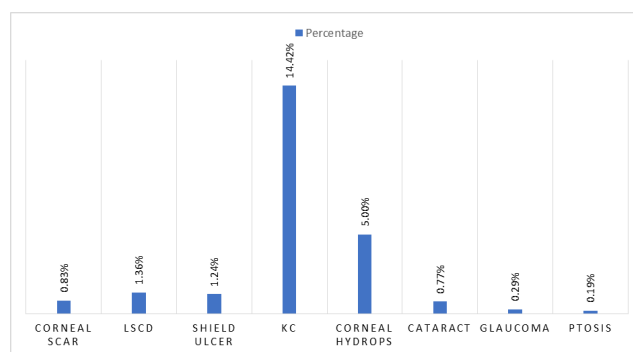


Fig. 2: Complications if VKC in the study

as mild, moderate, severe and blinding disease was followed based on the classification system by Nikhil S Gokhlae.¹³ Anatomical involvement of conjunctiva was divided into palpebral, limbal and mixed. Mild and moderate disease were treated with cold compression, allergen avoidance, dual action antihistaminic eye drops, lubricant eye drops. Based on periodicity of disease short pulses of mild surface acting steroids was used to prevent recurrences, while in chronic disease long term continuous therapy with topical tacrolimus or cyclosporine was initiated. For severe cases additional treatment with pulse of potent topical steroids was started. Cases of blinding VKC were put on potent steroid trail of six times per day for two weeks to rule out steroid response. Supratarsal steroids injection and debridement was done in shield ulcers and as per the case.

3. Results

All data was compiled and entered using Microsoft Excel sheet and analysed using software SPSS version 20.0. The data was analysed using descriptive statistics as and were deemed appropriate.

During the study duration of one year, 1684 cases were diagnosed to have VKC of which 1028 cases (61.05%) were male and 656 (38.95%) female. The most common age group of presentation was in the range 5 -10 years.(Figure 1)

Mean age of presentation was 7 ± 4.2 years, 42 patients (0.02%) presented after 20 years of age of which 22 cases had history of non-resolving childhood VKC and 20 had adult onset VKC.

Of the 1684 cases 960 (57%) had chronic perennial disease and 724 (43%) has seasonal disease. Personal history of atopy or allergic disorders which included asthma, allergic dermatitis or rhinitis was present in 286 (17%) patients.

According to severity score 863 cases (51.25%) had moderate disease, 591 cases (35.09%) had mild form of VKC respectively, the remaining cases had severe ($n=182$, 10.81%) or blinding ($n=48$, 2.85%) VKC.

In the anatomical distribution of cases majority, $n=616$ (36.58%) had limbal involvement, followed by mixed $n=576$ (34.20%) and palpebral $n=492$ (29.22%).

Various complications were noted in our study either due to progression of the disease or corticosteroid treatment related (Figure 2). Keratoconus was the most common associated complication $n=243$ (14.42%). Patients with severe VKC presented with diminution of vision due to shield ulcer $n=21$ (1.24%) followed by corneal scarring $n=14$ (0.83%) as the most common sight threatening complication. Other complications noted that were limbal stem cell deficiency (LSCD) and corneal hydrops, mechanical ptosis. Corticosteroid related complications included posterior subcapsular cataract and glaucoma respectively.

4. Discussion

In our study the Male: Female ratio was 1.6:1, Male preponderance was seen in our study in concordance to several studies,^{12,14,15} such as the multicentric study by Saboo et al¹⁶ from Italy found M:F ratio to be between 3.3 and 3.5, similar findings were conferred by Lambiase et al⁴ with male: female ratio as 3.5:1. Studies by Sheikh et al¹⁷ and Laiba et al¹⁸ also confer male preponderance, however in one study by Ukponmwan et al done in Nigeria female preponderance was reported.⁵

VKC is a disease of the younger age group.²⁻⁴ It usually starts before the age of 10 years and the earliest reported age of onset is 5 months.⁵ The mean age of onset in our study was 7 ± 4.2 years, similar to a study by S Bonni et al¹⁵ with mean age of onset at 7.1 ± 4.7 years.

The climate being tropical savanna type the predilection for VKC is almost same throughout the year with only slight exacerbation in summer season. Chronic perennial form was seen in 57% of the cases in our study, contrary to other parts of the country and world with temperate climatic conditions where more often seasonal exacerbations was noted as confirmed in studies by Bonni et al, Shafiq et al, Sofi et al;^{15,19,20} our patients also had a lesser association with atopic conditions (17%), as contrary to subjects in temperate population.^{4,11}

The frequency of subtype of VKC is variegated throughout the world population. In the Nigerian population 82.6% constituted palpebral form,⁵ Whereas in Italy 53.8% cases constituted limbal form and a study from southern India had 71.8% of mixed form.¹⁶ In our study the prevalence of limbal form (36.58%) is more as compared to the palpebral form (29.22%) in concordance with study by Sofi et al and Stephen et al.^{20,21}

Majority of patients had mild to moderate form of VKC. Severe VKC constituted 10.81% of the studied population. Blinding VKC which affected 48 cases (2.85%), was due to shield ulcer, corneal scarring, corneal hydrops and LSCD. These findings were in agreement with study by Leonardi A et al who used a comparable classification system.³ Range of complications were similar to the study by Sofi et al.²⁰

Keratoconus was the major associated complication with VKC,^{8,9} which was in concordance with study by Sofi et al conducted in Kashmir India.²⁰ Pentacam screening done in our study that could detect KC early, which aided in monitoring and preventing disease progression. These results were similar to studies on keratoconic eyes by Naderan et al and Cingu et al that confirmed VKC as an important association with keratoconus.^{22,23}

Limitation of the study was that it was a cross-sectional study design, and follow up could not be done on progression of KC and other complications.

5. Conclusion

Chronic perennial form of VKC and limbal form of VKC was more common in tropical savanna kind of climate in south India. There is a definitive association of keratoconus in VKC, however association with atopy was much less significant in this study. Pentacam screening played an important role for early detection of KC, thus corneal topography examination should be advocated for VKC when indicated on history and clinical examination.

6. Source of Funding

None.

7. Conflict of Interest

None.

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