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ORIGINAL RESEARCH

Clinical Study of Vernal Keratoconjuctivities in Rural Ppulation- An Observational Study

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ABSTRACT

Background: Vernal keratoconjunctivitis (VKC) is a chronic, bilateral allergic disease of the external eye that leads to chronic irritation, watering, and discharge. It occurs universally but is more common in hot and dry environments. It typically affects children in their first two decades and although the majority of cases have a good prognosis and This study is undertaken to stress upon the importance of clinical manifestations, management and prevent the complications of the disease and those secondary to its long-term medication.Aim of study:To study the clinical features (ocular symptoms, signs and type), the age and sex distribution, the seasonal variation of symptoms,and the effect of topical therapy on VKC patients.

Materials and Methods: 80 patients with VKC selected at random, who attended the department of ophthalmology Govt Medical College, Suryapet from December 2019 to May 2021. The relevant details of history and clinical examination of the patients were recorded on a specifically designed proforma. The type and severity of VKC and its association with corneal involvement was noted. Clinical observation and evaluation of clinical signs and symptoms were performed before and after drug therapy at first visit, weekly interval for 2 weeks and at the end of 3 months. Therapeutic options are many, in most cases topical and chosen on the basis of the severity of the disease.

Results: 35 out of 80 patients were in the 6-10 years of age. The male: female ratio is 2.4:1.1. The majority of the patients presented in the month of April. Family H/O of allergy was present in 1 patient. 74 patients showed seasonal symptoms and 6 patients showed perennial symptoms. Mixed type found in 66%.Itching was present in 68 patients. 95 had papillae on the upper tarsal conjunctiva.

Conclusion: This study shows that vernal keratoconjunctivitis has early age of onset with higher than 2:1 frequency in males over females with frequent presentation during the spring and hot month (April). Mixed type of VKC is more common, itching is most common symptom, Papillae on upper palpebral conjunctiva is the most common sign, SPK is the commonest form of corneal involvement. The treatment of choice for mild to moderate VKC is a dual acting topical ocular medication (mast cell stabilizing with antihistamine effect). Mild steroids in mild to moderate cases and potent steroids in severe cases help in rapid relief of symptoms, but should be used with caution.

Keywords: Vernal keratoconjunctivitis, seasonal, ocular, allergy, responded.

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INTRODUCTION

Allergic disease as a clinical entity is well known from ancient times. Fifteen percent of world's population suffers from allergic disease. It is estimated that 10 percent to 20 percent

of population of India suffers from one or the other allergic disease, of these more than one third have ocular allergic manifestations. The eye is frequent target of inflammation in both local and systemic allergies like allergic rhinitis, atopic dermatitis, and asthma. Allergic conjunctivitis includes the diverse group of diseases; the largest group being associated with exogenous allergens. The four classic forms of allergic conjunctivitis are seasonal allergic conjunctivitis, vernal keratoconjunctivitis, giant papillary conjunctivitis and atopic keratoconjunctivitis. Vernal Keratoconjunctivitis (VKC) was first described by Arlt in 1846 as conjunctivitis lymphatica. It is characterized by chronic, bilateral, recurrent, interstitial, self-limiting allergic inflammation of conjunctiva having a periodic seasonal incidence. It is believed to be diseases of childhood; mean age of presentation is 12 years and generally resolves after puberty, usually around 4–10 years after onset. The disease is more common among males, with the male to female ratio varying from 4:1 to 2:1. It is characterized by itching, redness, discomfort, stringy discharge, photophobia, burning and stinging, giant papillae on the upper tarsal conjunctiva, superficial keratopathy, and corneal shield ulcers, keratoconus leading on to permanent corneal damage. The seasonal character of the disease is most striking feature, it starts in May and June and recedes in autumn i.e. the inflammation often goes into remission in cooler months. The immunopathogenesis of VKC is multifactorial involving a Th2 mediated mechanism with an overexpression of cytokines, growth factors; eosinophils and eosinophilic proteins.[4] Patients with VKC have a family history of atopic diseases in 49% of cases. These patients may also have a medical history of other atopic conditions including asthma (26.7%), rhinitis (20%), and eczema (9.7%) and showing no evidence of infection.

The predominant symptom of VKC is profound itching. Other symptoms are excessive tearing, mucus production, photophobia, and burning or foreign body sensation. The classic sign of palpebral VKC is the giant papillae or cobblestone in the upper tarsal conjunctiva. These papillae markedly increase the mass of the upper lid, and hence ptosis is an additional typical sign. Inflammation of the bulbar conjunctiva is variable, but a ropy, lardaceous thread almost invariably can be found in the inferior fornix.

The diagnosis is generally based on signs and symptoms of the disease, but in difficult cases can be aided by conjunctival scraping, demonstrating the presence of infiltrating eosinophils.

Although various form of therapy can be used for symptomatic relief, there is no curative therapy. Chronic VKC in children is usually one of the difficult problems in management. The long term prognosis is generally good; however 6% of patients develop corneal damage, cataract, or glaucoma.

In a recent study by Arif et al,20.3% eyes had corneal scarring,5.9% eyes had keratoconus,3.1% eyes had shield ulcer and 2.4% eyes had corneal neovascularization. This all lead to severe visual loss.[3]

Vernal keratoconjunctivitis (VKC) is a bilateral,seasonal,external ocular inflammatory disease of unknown cause. It is a seasonal atopic disease in young children(more common in boys).[4]

In a recent study by DerejeHayilu et al, it was found that mixed type of vernal keratoconjunctivitis was the most frequent form which was found in 34 out of their 43 cases of VKC(81.4%).[5]

The clinical management of VKC required a swift diagnosis, correct therapy, and evaluation of the prognosis.

This study is undertaken to stress upon the importance of clinical manifestations, management and preventionof the complications of the disease and those secondary to its long-term medication.

Objectives of the study:

1. To study the clinical features (ocular symptoms, signs and type) of VKC.
2. To study the age and sex distribution of VKC.
3. To study the seasonal variation of symptoms of VKC.
4. To study the effect of topical therapy (antihistamines, mast cell stabilisers, mildcorticosteroids, NSAID's and lubricant drops) on VKC.

MATERIALS & METHODS

80 patients with VKC selected at random, who attended the department of ophthalmology Govt Medical College, Suryapet were the subjects of this study. The period of this study was from December 2019 to May 2021 (one-and-a-half-year study).

The relevant details of history and clinical examination of the patients were recorded on a specifically designed proforma. The history was obtained with special attention to

- Occurrence of symptoms seasonal or perennial
- Personal and or family history of allergy
- Aggravating and relieving factors
- Past treatment

The type and severity of VKC and its association with corneal involvement was noted.

The severity was graded as follows

- Mild; few symptoms, seasonal, small papillae, no corneal involvement.
- Moderate; troublesome symptoms, almost perennial, with moderate sized papillae and no corneal involvement.
- Severe; severe symptoms, perennial with large fleshy papillae and corneal involvement.

Ocular examination included testing of Visual Acuity, Ophthalmoscopy, Retinoscopy, Biomicroscopy, and recording of IOP with Applanation Tonometry and in selected cases Keratometry.

Clinical observation and evaluation of clinical signs and symptoms were performed before and after drug therapy at first visit, weekly interval for 2 weeks and at the end of 3 months. Each of the visits were designated as visit 0(first visit), visit 1(one week after visit 0), visit 2 (2 weeks after 0 visit), visit 3 (3 month after visit 0).

Therapeutic options are many, in most cases topical should be chosen on the basis of the severity of the disease. The most effective drug steroids should however be carefully administered, and only for brief period, to avoid secondary development of glaucoma and cataract. All patients were informed of the aims of the clinical trials.

Inclusion Criteria

Patients with symptoms and signs suggestive of VKC.

Patients with allergic conjunctivitis having symptoms and signs of VKC

Exclusion Criteria

Infective conjunctivitis either bacterial or viral Contact lens induced conjunctivitis.

RESULTS

The youngest patient in this study was 4 years and the oldest was 34 years. The majority of patients i.e. 35 out of 80 were in the 6-10 years of age. 70 patients were in the age group of 6-20 years. 10 patients were over the age of 20 years.

Table 1: Age and Sex Distribution of Patients with VKC.

Sl.No.	Age (Yrs)	Male	Female	Total	Percentage
1.	1 -5	03	01	4	5%
2.	6 -10	35	02	37	46.25%
3.	11 -15	10	07	17	21.25%
4.	16 -20	07	05	12	15%
5.	21 -25	03	02	05	6.25%
6.	26 -30	03	01	04	5%
7.	31 – 35	00	01	01	1.25%
	Total	61	19	80	100%
	Percentage			------	------

Table 2: Seasonal Variation of Symptoms

Months	No. of Patients	Percentage
December-19	7	8.75
January-20	2	2.5
February-20	4	5
March-20	4	5
April-20	8	10
May-20	7	8.75
June-20	1	1.25
July-20	2	2.5
August-20	1	1.25
September-20	1	1.25
October-20	3	3.75
November-20	4	5
December-20	7	8.75
January-21	7	8.75
February-21	4	5
March-21	7	8.75
April-21	7	8.75
May-21	4	5

Table 3: Type of VKC at the Time of Presentation

Type	No. of patients	Percentage
Palpebral	18	22.5
Mixed	56	70
Bulbar	06	7.5

Table 4: Ocular symptoms of VKC patients

Symptoms	No of Patients	Percentage
Itching	68	85
Watering	60	7.5
Discharge	44	55
Redness	63	78.75
Photophobia	02	2.5
Ocular Pain	07	8.75
Fb Sensation	19	23.75

Burning Sensation	35	43.75
Pricking Sensation	03	3.75
Lid Swelling	06	7.5

Itching was the commonest symptom seen in 68 patients followed by redness in 63, watering 60 and discharge in 44 patients. Lid swelling due to giant papillae was found in 6 patients.

Table 5: Ocular Signs in VKC Patients

Sl. No	Signs	No ofPatients	Percentage
1.	Papillae on upper palpebral conjunctiva (PP)	76	95
2	Perilimbal gelatinous thickening(GM)	31	38.75
3	Conjunctival congestion(CC)	62	77.5
4	Limbal papillae(LP)	40	50
5	Superficial punctate keratitis(SPK)	07	8.75
6	Horner trantas spot(TS)	16	20
7	Keratoconus(KC)	01	1.25
8	Pseudogerontoxon(PX)	01	1.25
8	Vernal shield ulcer(VSU)	0	0
9	Perilimbal pigmentation(PPIG)	05	6.25
10	Mechanical ptosis(MP)	01	1.25

Majority of patients i.e. 95 had papillae on the upper tarsal conjunctiva. Conjunctival congestion was found in 62 patients, gelatinous limbal thickening in 31 of patients and limbal papillae in 40 patients.

Table 6: Patients with Atopies and Family History of Atopy

Atopies	No of Patients	Percentage
Asthma	4	5
Eczema	3	3.75
Allergic Rhinitis	3	3.75
Family History of Allergy	1	1.25

In this study family H/O of allergy was present in 1 patient. Atopies like asthma in 4, eczema in 3 and allergic rhinitis in 3.

Table 7: Seasonal and Perennial Distribution of VKC Patients

	No of patients	Percentage
Seasonal	74	92.5
Perennial	06	7.5

Table 8: Clinical Severity Grading in Patients with VKC

	No of patients	Percentage
Mild	38	47.5
Moderate	25	31.25
Severe	19	23.75

DISCUSSION

80 patients were enrolled in this study for the evaluation of clinical signs and symptoms and management of vernal keratoconjunctivitis. The results are presented in the observation tables.

The age and sex distribution of patients was analyzed. The youngest patient in this study was 4 years and the oldest was 34 years. The majority of patients i.e. 35 out of 80 were in the 6-10 years of age. 70 patients were in the age group of 6-20 years. 10 patients were over the age of 20 years.Ujwala S Saboo and co-workers reported persistent disease beyond 20 years of age in 12% patients.[6]

The sex distribution shows that 61 of the patients were males and remaining 19 patients were females. The male: female ratio is 2.4:1.1. Lambiase and co-workers found M: F ratio of 3.5:1 in a prospective study conducted at 6 Italian referral centers between March 2005 and March 2006.[7]

Leonardi and co-workers found M: F ratio of 3.3:1 in a demographic and epidemiological study involving case series of 406 VKC patients.[8]

This table shows seasonal changes of the disease. The majority of the patients presented in the month of April.Ujwala S Saboo and co-workers also reported highest incidence of patients in the months of April-May, which corresponds to the hot dry weather in the southern part of India.

Emnert's 1988 classification has been used to classify VKC into palpebral, bulbar and mixed types. The majority of patients were of the mixed type 66%. Palpebral form of the disease accounted for 28%, while the bulbar form made up 6% of the total number of patients.

The multi centric study from Italy reported predominance (53.8%) of limbal presentation, whereas Ujwala S Saboo and co-workers found majority of their cases (71.8%) had a mixed presentation comprising of both limbal as well as palpebral involvement, followed by isolated palpebral involvement in 15.6% and limbal involvement in 12.6% of the patients.[6]

This showed the relative frequency of occurrence of the different symptoms commonly experienced by patients with VKC.

Itching was the commonest symptom seen in 68% patients fallowed by redness 63%, watering 60% and discharge 44%. Ujwala S Saboo and co-workers also found almost similar results -itching (88%), redness (86%), and watering (65%).[6]

This showed the relative frequency of occurrence of the different signs commonly seen in patients with VKC.

Majority of patients i.e. 95 had papillae on the upper tarsal conjunctiva. Conjunctival congestion was found in 62 patients and gelatinous limbal thickening in 40 of patients.Ujwala S Saboo and co-workers found palpebral papillae in 85% of patients and limbal thickening in 73% of patients with VKC.[6]

Perilimbal conjunctival pigmentation was present in 5% patients. Perilimbal conjunctival pigmentation is a new clinical sign described in VKC. Ujwala S Saboo and co-workers found perilimbal conjunctival pigmentation in 52/468 (11%) of the patients.[6]

This showed the association of atopy and family history of allergy in patients with VKC. Family H/O of allergy was present in 1 patient. Atopies like asthma in 4, eczema in 3 and allergic rhinitis in 3 patients. This is in contrast to the picture seen in the temperate zones as reported by Lambiase et al,[7] and Bonini et al,[9] who found associated systemic allergies in 41.5-48.7% patients in different series.

Positive personal or family history of allergies was present in only 4.91% of patients in study conducted by Ujwala S Saboo and co-workers.[6]

This table shows seasonal and perennial distribution of patients. In this study 64 patients showed seasonal symptoms and 16 patients showed perennial symptoms.Ujwala S Saboo and co-workers described chronic perennial form in 36% of patients.[6]

The rationale of grading patients as mild, moderate and severe for treatment is due to 2 reasons:

There is substantial evidence to suggest that mast cell degranulation and histamine mediated inflammatory response plays an important role in pathogenesis of vernal conjunctivitis. New

generation of drugs such as olopatadine, has shown dual activity of mast-cell stability and H1 receptor antagonism. Olopatadine (0.1%) is a selective H1 antagonist with mast-cell-stabilizing properties. It decreases the mucus discharge in VKC by reducing the goblet cell density in the conjunctiva. Olopatadine ophthalmic solution is safe and effective in the treatment of allergic conjunctivitis, with the 0.1% concentration of olopatadine being optimal. The rapid onset and at least 8-hour duration of action of olopatadine indicates that the drug can be used twice daily.

The long-term use of steroids carries considerable risk of complications as steroid induced glaucoma steroid induced cataract and secondary infections. The complications may eventually lead to loss of vision. This is especially pertinent to the semiliterate and illiterate samples of this study.

21/100 patients were already receiving treatment when they presented to Govt medical college, Suryapet first time. It is noteworthy that treatment at presentation could have altered the disease severity and may not represent the true clinical spectrum.

The first line treatment of choice for mild to moderate cases is a dual acting topical ocular medication (mast cell stabilizing with antihistaminic effect).

In the present study 95% patients were put on 0.1% olopatadine eye drops 2 times a day. Additional treatment such as 0.5% ketorolac 4 times a day was added in 5 patients and 0.1% bromofenac 2 times a day in 3 patients and 0.1% nepafenac 2 times a day in 1 patient along with olopatadine at visit 0. In 16 patients with persistent symptoms with olopatadine alone 0.5% ketorolac was added in subsequent visits. 1patient received 0.5% ketorolac with lubricating eye drops and 1 received 0.5% ketorolac with antibiotic eye drops. All these patients who received 0.5% ketorolac alone or with other drugs responded well. Follow – up patients using 0.1% olopatadine showed that there were no side effects.

Lubricating eye drops was added in 10 patients receiving olopatadine eye drops in subsequent visits for symptomatic relief. These artificial tear drops provide a barrier function and help to improve the first line defense at the level if conjunctival mucosa. These agents help to dilute various allergens and inflammatory mediators that may be present on ocular surface, and may help flush the ocular surface of these agents.

38 patients were treated with topical corticosteroids. 12/38 patients were put on Flurometholone 0.1% 4 times a day. 6/12 patients with severe disease were put on Flurometholone at visit 0 and in remaining 6 patients were treated with Flurometholone in the subsequent visits. All patients responded well. 26/38 patients were treated with 0.2% Lotoprednol etabonate4 times a day in the visit

All patients were monitored regularly by checking IOP. All patients were treated with topical corticosteroids in the active stage of disease along with mast cell stabilizers or antihistaminic eye drops for long-term prophylactic use. Supratarsal injections of corticosteroid were used in 2 patients to treat severe non-responding disease. After 2 minutes of 4% xylocain instillation a 26G, 5/8-inch needle was positioned in the supratarsal subconjunctival space and 10mg oftriamcinolone acetonide was injected. None of the patients receiving supratarsal steroid injection had post-treatment glaucoma. One responded well but other patient had recurrence after 1 month of Supratarsal injections of triamcinolone acetonide.

Topical 1% cyclosporine A was used in 1 patient. The patient had severe disease. The patient did not improve in the study period. 5 patients in this study were treated with systemic antihistaminic. 4/5 patients were feeling symptomatically better.

One patient who was refractory to steroid eye drops was treated with 0.03% tacrolimus eye ointmentapplied into the lower fornix twice a day and responded well.

One patient had mild keratoconus(0.74%). Ujwala S Saboo and co- workers found keratoconus in 6% of VKC patients.[6]

Mechanical resection of giant papillae was done in 2 patients and but both patients had recurrence after 2months. Later treated with cyclosporine A eye drops and responded to the therapy.

CONCLUSION

This study shows that vernal keratoconjunctivitis has early age of onset with higher than 2:1 frequency in males over females with frequent presentation during the spring and hot month (April). Mixed type of VKC is more common than palpebral and bulbar form is the least common. Itching is most common symptom experienced by VKC patients. Papillae on upper palpebral conjunctiva is the most common sign. SPK is the commonest form of corneal involvement. The treatment of choice for mild to moderate VKC is a dual acting topical ocular medication (mast cell stabilizing with antihistamine effect). Mild steroids in mild to moderate cases and potent steroids in severe cases help in rapid relief of symptoms, but should be used with caution. Preventive measures like avoidance of allergen, cold compression provides symptomatic relief. Artificial tear substitutes provide a barrier function and help to improve the first – line defense at the level of conjunctival mucosa. Systemic and or topical antihistamines may be given to relieve acute symptoms. Immunomodulators are helpful in refractory cases.

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