Original Research Article

Study of clinical profile of VKC and their management by stepladder approach

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Abstract

Background: The conjunctiva of the eye being similar to the nasal mucosa is equally susceptible to allergic reactions**.** Allergic conjunctivitis is a Type I (immediate) hypersensitivity reaction, mediated by degranulation of mast cells in response to the action of IgE, however there is evidence of an element of Type IV hypersensitivity in at least some forms**.** Vernal keratoconjunctivitis (VKC) is a chronic, bilateral, at times asymmetrical, seasonally exacerbated, allergic inflammation of the ocular surface, involving tarsal and/or bulbar conjunctiva. The present study was conducted to see the effect of step ladder pattern approach in the management of vernal keratoconjunctivitis patients. **Materials and Methods:** This prospective cross-sectional study has been done in Department Of Ophthalmology at Government Medical College of Rajnandgaon (C.G.) India, from August 2016 to July2017. A total of 115 consecutive patients with VKC (coming from urban and rural areas around Rajnandgaon) were included in the study, but a total of 72 of those patients were included in the follow-up study. The following data was recorded - Age, gender, personal and family allergies, age of onset of the disease, presenting symptoms, duration of disease, and details of ophthalmic examination including visual acuity, slit lamp examination for clinical signs, intraocular pressure, fundus examination, details of treatment (medical and surgical), and complications. **Result:** In this study 11 to 20 year of age group subjects were most commonly affected from VKC as compared to 5 to 10 year of age group. In this study out of 72 cases, maximum cases were mild (48.61%), Moderate cases were 31.94% and 19.44% cases were in severe form. We had 59(81.94%) patients with visual acuity ranging between 6/6-6/18 and 12 (16.66%) patients with visual acuity ranging between 6/18—6/60 Patients with visual acuity ranging <6/60 was one. Most common sign of VKC was Papillae (43.92%) followed by palpebral conjuctival hyperemia (35.28%) and bulbar conjuctival hyperemia (25.2%). Avoidance of allergen, Lubricants, antihistaminic and mast cell stabilizers were used for mild grade of VKC, whereas potent steroid eye drop and CSA 1% were additionally used for severe grade of VKC. **Conclusion:** The stepladder approach is a novel way of managing these difficult cases in day-to-day practice.

Key Words: Vernal keratoconjunctivitis (VKC), Step ladder approach, Anti-allergic treatment.

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INTRODUCTION

The conjunctiva of the eye being similar to the nasal mucosa is equally susceptible to allergic reactions.[1] Allergic conjunctivitis is a Type I (immediate) hypersensitivity reaction, mediated by degranulation of mast cells in response to the action of IgE, however there is evidence of an element of Type IV hypersensitivity in at least some forms.[2] The various types of allergic conjunctivitis are - seasonal allergic conjunctivitis (SAC), perennial allergic conjunctivitis (PAC), vernal keratoconjunctivitis (VKC), atopic keratoconjunctivitis (AKC) and giant papillary conjunctivitis (GPC).[3] Vernal keratoconjunctivitis (VKC) is a chronic, bilateral, at times asymmetrical, seasonally exacerbated, allergic inflammation of the ocular surface, involving tarsal and/or bulbar conjunctiva. It was first mentioned in the ophthalmic literature as conjunctiva lymphatica more than 150 years ago. It is also called as spring catarrh, phlyctenula pallida, circumcorneal hypertrophy, recurrent

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vegetative conjunctiva, verrucosa conjunctiva and aestivale conjunctiva. VKC usually starts before the age of 10 years and is more common among males, with the male to female ratio varying from 4: 1 to 2: 1 and generally resolves after puberty.[4] The characteristic sign is the presence of giant papillae (cobblestone) on upper tarsal conjunctiva. It is also associated with severe itching; incapacitating photophobia and trantas dots. Cornea may be affected and can lead to central corneal scarring.[1] The main treatment options include topical decongestants, antihistaminics, mast cell stabilizers and anti-inflammatory agents.[5] Bonini *et al* described the tailored approach to treatment of VKC based on their grading system.[6] Grade 1 and 2 were treated with anti allergic eye drops while grade 3 and 4 were treated with additional topical steroids. This simplistic approach is highly inadequate to manage a complex problem like VKC. It does not give any guidelines for other treatment options for VKC such as the use of topical cyclosporine and promotes the usage of only topical steroids in patients with corneal involvement. The stepladder approach aims to provide the safest possible way to control allergic inflammation based on its severity and periodicity.[7] This means that we use less potent medications in mild disease and switch to more potent medications for the more severe forms of disease. Treatment and natural fluctuations will alter the grade of disease and will necessitate alterations in therapy. Typically as the allergy wanes we go down the ladder and use safer medications and as it worsens we go up the ladder using more potent medications. There are limited numbers of studies on the outcome of stepladder approach in the current study area. With the above background, the present study was conducted to see the effect of step ladder pattern approach in the management of vernal keratoconjunctivitis patients at Govt. Medical college, Rajnandgaon (C.G.), India.

MATERIALS AND METHODS

This prospective cross-sectional study has been done in Department Of Ophthalmology at Government Medical College of Rajnandgaon (C.G.) India, from August 2016 to July2017. A total of 115 consecutive patients with VKC (coming from urban and rural areas around Rajnandgaon)were included in the study, but a total of 72 of those patients were included in the follow-up study.

Inclusion Criteria

1. Age group 5-20 years of age
2. New patients of VKC and already diagnosed as a case of VKC who attended our EYE OPD
3. Presented in eye OPD with itching, ropy discharge, papillae, burning and foreign body sensation, lacrimation and vasodilation.

Exclusion Criteria

1. Other causes of allergic conjunctivitis.
2. History of chemical exposure, thermal and radiation injury.
3. Bacterial, viral or toxic cicatricial conjunctivitis
4. Underwent for any ocular surgery.
5. Any other medical conditions like AIDS, Lymphoma and malingnancy.

The diagnosis of VKC was made on the basis of history and typical signs and symptoms. Active VKC was diagnosed based on the complaint of ocular itching and the presence of upper tarsal conjunctival papillae and/or limbal hypertrophy with bulbar conjunctival congestion. The following data was recorded - Age, gender, personal and family allergies, age of onset of the disease, presenting symptoms, duration of disease, and details of ophthalmic examination including visual acuity, slit lamp examination for clinical signs, intraocular pressure, fundus examination, details of treatment (medical and surgical), and complications. The Isolated palpebral form included patients with characteristic signs of papilae >1mm on the upper tarsal conjunctiva with no limbal infiltration, while the isolated limbal form consisted of papillae of < 1mm on the upper tarsal with limbal infiltration and mixed form had features of both palpebral and limbal types of VKC. The severity of the disease was graded based on the clinical signs at initial presentation. Visual impairment was assessed by means of WHO criteria for visual disabilities. Appropriate treatment was provided as per step ladder pattern approach. The number of relapses and number of patients with decreased visual acuity were also evaluated in the follow-up (1wk, 3wk, 6wk, after 2 month). Data was recorded in MS EXCEL and checked for its completeness and correctness then it was analysed by using suitable statistical software.

RESULTS

Table 1: Distribution of patients according to age and sex

	Age	No.	%
Male	5 – 10 yrs	21	29.16%
	11 – 20 yrs	32	44.44%
Female	5 – 10 yrs	07	9.72%
	11 – 20 yrs	12	16.66%

Table 2: Distribution of patients according of clinical types of vkc

Clinical types of VKC	No.	%
Limbal	11	15%
Tarsal	23	32%
Mixed	38	53%

In this study 11 to 20 year of age group subjects were most commonly affected from VKC as compared to 5 to 10 year of age group. Male were more affected then females and mixed type of VKC was more common followed by tarsal type of VKC. [Table 1 and Table 2]

Table 3: Distribution of pts according severity of disease

Severity of diseases	No. (%)
Mild	35(48.61%)
Moderate	23(31.94%)
Severe	14(19.44%)
Blinding	00

In this study out of 72 cases, maximum cases were mild (48.61%), Moderate cases were 31.94% and 19.44% cases were in severe form. [Table 3]

Table 4: Distribution of patients by visual acuity

Visual Acuity	No. (%)
6/6 to 6/18	59(81.94%)
6/18 to 6/60	12(16.66%)
< 6/60	01(1.38%)

We had 59(81.94%) patients with visual acuity ranging between 6/6-6/18 and 12 (16.66%) patients with visual acuity ranging between 6/18—6/60 Patients with visual acuity ranging <6/60 was one. [Table 4]

Table 5: Distribution of patients according to signs

No.	Signs of VKC	No.	%
1	Bulbar conjuctival hyperemia	35	25.2%
2	Palpebral Conjuctival Hyperemia	49	35.28%
3	Chemosis	25	18%
4	Papillae	61	43.92%
5	Giant Papillae	12	8.64%
6	Tranta"S Spots	14	10.08%
7	Spk	11	7.92%
8	Shield Ulcer	00	00

Most common sign of VKC was Papillae (43.92%) followed by Palpebral Conjuctival Hyperemia (35.28%) and Bulbar conjuctival hyperemia (25.2%). [Table 5]

Table 6: Medications according grading of vkc

No.	Medication	Mild	Moderate	Severe
1	Avoidance of allergen	35	23	14
2	Lubricants	35	23	14
3	antihistaminic+mast cell stabilizers	35	23	14
4	Low frequency loteprednol	00	23	14
5	Potent steroid eye drop	00	00	04
6	CSA 1%	00	00	02
7	Tacrolimus ointment	00	00	00
8	Supratarsal steroid	00	00	00
9	Excision	00	00	00

Avoidance of allergen, Lubricants, antihistaminic+mast cell stabilizers were used for mild grade of VKC, whereas Potent steroid eye drop and CSA 1% were additionally used for severe grade of VKC. [Table 6]

16.66% and 13.8% of the study subjects had Conjuctivization of cornea and Spk respectively. [Table 7]

Table 7: Complications in VKC

No.	Complications	No. (%)
	Total no. of patients	72
1	Spk	10(13.8%)
2	Conjuctivization of cornea	12(16.66%)
3	Shield ulcer	00
4	Keratoconus	00
5	Microbial keratitis	00
6	Dellen	00
7	Cataract	01(1.38%)
8	Glaucoma	00
	All complications	23(31.94%)

DISCUSSION

Limitations to current management strategies are the lack of well-defined management guidelines. The choice of medications may vary greatly for the same severity of disease from physician to physician. This is often because of a lack of grading systems to gauge and classify the severity of VKC and standard guidelines to suggest the most appropriate safe therapy. Inadequate counseling and unrealistic expectations often result in overuse, misuse and self use of steroids and it is not uncommon to see patients with steroid related complications. Over medication with steroids can cause loss of vision due to steroid related complications while under medication and persistent inflammation can also cause vision loss due to corneal scarring and stem cell damage. A delicate balance between the use of medications and side effects needs to be tailored to restrict tissue damage and also avoid medication related complications. Step ladder pattern approach is a new dimension in the management of vernal keratoconjunctivitis. Information on VKC in several countries has been based mainly on hospital data. Many hospital studies showed a prevalence between 2 to 6% 6among patients of all ages.[7,8] A study from Nigeria found a population VKC-prevalence of 18.1% among primary school children. This is much higher than the prevalence (4-5%) reported by the few available population-based studies with similar design from Africa.[9,10] Our study prevalence may be higher because of the population-based study design, with minimal selection bias. In addition, quiescent (19.3%) and mild (60.1%) cases of VKC were included in the study as this is what was seen in the population during the duration and season of the study. These grades are reported as having been very common.[11] Moreover, to further explain our high prevalence, it is reported that the incidence of ocular allergy which will affect a prevalence report is underreported.[12] Furthermore, parents are most unlikely to take their children to a hospital for quiescent and mild cases of VKC. Therefore these grades of VKC will go unaccounted for in hospital data. Like a similar study from Rwanda, our study described VKC as it presents

itself in the population, which has the 0–14-year age range constituting 42% of the population.[13,14] Though there was no statistical significance in the gender, more males were clinically affected. Our study corroborates the information that males are said to be more affected. This follows the general pattern seen in Nigeria as well as in some countries.[15,16,17] The onset of VKC is usually after the age of 5 years; the condition eventually resolves around puberty, only rarely persisting beyond the age of 25 years.[6] The diagnosis of VKC is usually made on clinical examination, based on the patient's history and the presence of typical clinical signs and symptoms. The main symptoms include intense ocular itching which may be associated with lacrimation, photophobia, foreign body sensation, and burning. Thick mucus discharge from the eyes and eyelid dropping also occur. The symptoms may occur throughout the year but are characteristically worse during the dry season. In this study the most common clinical type was the tarsal type of VKC. Palpebral forms are said to be more prevalent in Europe and the Americas, whereas mixed and limbal forms are more seen in Asia and Africa, respectively, with some geographic variation and probably hospital attending bias.[9,18.]

CONCLUSION

The natural history of VKC is one of resolution, specifically with the arrival of puberty and there is a relative lack of information on the long-term history of the disease. However, further follow-up may not be available because of the high probability for disease resolution with time. VKC is a disease with myriad presentations, some of which can generate long-term sequelae. Symptoms can be quite bothersome, and untreated disease can be rather severe; therefore, appropriate treatment can be life- and sight-changing. Grading of the severity of disease and periodicity of disease can be very useful for deciding the appropriate line of management. The stepladder approach is a novel way of managing these difficult cases in day-to-day practice. Severe and refractory VKC is a serious condition with significant morbidity and may not still be satisfactorily addressed by currently available treatment options and is a matter of ongoing research.

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