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Clinical Profile of Vernal Keratoconjunctivitis (VKC) Patients: A Retrospective Study at a Peripheral Combined Military Hospital in Bangladesh

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Abstract

Background: Vernal keratoconjunctivitis (VKC) is an allergic eye disease that especially affects young boys. The most common symptoms are itching, photophobia, burning, and redness. This study was conducted to assess the clinical profile of vernal keratoconjunctivitis (VKC) among the local population reported at a peripheral combined military hospital over 1 year. This study aimed to analyze the cases of vernal keratoconjunctivitis at a peripheral combined military hospital. **Material & Methods:** This is a retrospective study carried out in the Department of Ophthalmology at Combined Military Hospital, Saidpur. A total number of 110 patients with VKC were diagnosed based on their history, clinical features, and characteristic symptoms and sign over a period of 1 year from Jan 2021 to Dec 2021. Best-corrected visual acuity (VCVA) was assessed and each patient was thoroughly examined with a Slit Lamp Bi microscope, Fluorescein staining, and Tear film break-up time. Follow-up was done every 4 weeks, 3 months, and 6 months for 01 year. A purposive sampling technique was used in this study. Data was collected by a pre-designed questionnaire. All data were analyzed using SPSS version 20 (IBM Corp, Armonk, NY, USA) results were compiled in the frequency distribution table. Informed written consent was taken from all participants. Ethical clearance was obtained by the ethical committee of CMH. **Results:** Out of 110 patients, 80 (72.72%) were male and 30 (27.27%) were female. The highest incidence of VKC occurred in the age group of 11–15 years. In maximum cases 70 (63.63%) had palpebral form followed by mixed form 25 (22.72%) and then bulbar form 15 (13.63%). Corneal complications occurred in 27 (24.54%) patients; Out of 27, 25 patients had minor complications and 2 had major complications. The minor complications were usually superficial punctate keratopathy (SPK) or other epithelial disturbance. Major complications were superior pannus and pseudogerontoxon. Although patients with VKC often give a history of allergies or atopic diseases such as allergic rhinitis, asthma, or hay fever, in the present study, coexisting allergic conditions could be detected only 40 (36.36%) patients. **Conclusion:** VKC is a common form of allergic conjunctivitis among the age group of 11–15 years of male patients. The most common is the palpebral form followed by mixed and then bulbar forms. Some cases showed a history of atopy and other allergic conditions.

Keywords:- Bulbar, Palpebral, Vernal keratoconjunctivitis.

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INTRODUCTION

Ocular allergy is a very common disorder. This altered reactive state of the eye is usually a result of local response to an antigen. Since the conjunctiva is most often affected, ocular allergy and allergic conjunctivitis are often considered to be synonymous. Allergic conjunctivitis may manifest itself as a seasonal allergic or Hay Fever conjunctivitis, perennial allergic conjunctivitis, atopic keratoconjunctivitis, vernal keratoconjunctivitis, and giant papillary conjunctivitis. Vernal keratoconjunctivitis (VKC) is an ocular allergic disease, observed in children and young adults presenting with complaints of severe itching, redness, and photophobia accompanied by ocular discomfort and lacrimation.[1] It is a chronic ocular allergy that affects mostly children and adolescents living in warm or hot climatic conditions. VKC primarily affects boys more than girls in the first decade of life around the age of 7 years. The male: female ratio observed is 2.3:1.[2] The onset of the disease is usually after the age of 5 years and resolves around puberty, only rarely persisting beyond the age of 25 years.[3] Various exogenous, as well as endogenous causes, have been reported to be associated with the etiopathogenesis of VKC. An immune mechanism is found to be involved in its development as suggested by various studies.[4] Patients with VKC frequently have a family or medical history of atopic diseases, such as asthma, rhinitis, and eczema. However, VKC is not associated with a positive skin test or RAST in 42–47% of patients, confirming that it is not solely an IgE-mediated disease.[5] The main pathogenic mechanism is immunoglobulin E mediated; however, there may be non–immunoglobulin E and certain nonspecific hypersensitivity mechanisms. The predominant cell types involved are CD4 T cells and eosinophils.[6] So far, no genetic predisposing factor has been identified for VKC but the predominance of VKC in Asia and Africa, along with the persistence of this predilection in migrated African and Asian populations, strengthens the possibility of a genetic predisposition.[7] In terms of clinical features, patients with VKC often present with symptoms of intense itching, redness, and watering eyes. They also may complain of photophobia and foreign body sensation. Clinical signs of VKC include a papillary reaction of the upper tarsal conjunctiva and throughout the limbus.[8] Knowledge of the 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 the clinical profile of VKC at Combined Military Hospital, Saidpur.

Objective

General Objective

- To analyze the clinical profile of vernal keratoconjunctivitis

Specific Objectives

- To see the age and sex distribution of the study population.
- To know the clinical presentation among the participants.
- To know the disease pattern.
- To see the ocular signs in VKC
- To determine the extent of corneal involvement.
- To see its association with allergic disease.

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- To know the hematological profile of the patients.

MATERIAL AND METHODS

This is a retrospective study conducted in a Combined Military Hospital, Saidpur. 110 patients with VKC who were diagnosed on the grounds of their history, the presence of characteristic symptoms, and the basis of their clinical features were included in the study over 01 year from Jan 2021 to Dec 2021. The history of each patient was taken including a record of age, sex, place of residence, age at onset of the disease, seasonal variations, associated allergic or "atopic" illnesses, and family history of VKC or associated allergic or atopic conditions. Best-corrected visual acuity was assessed and each patient was thoroughly examined with a Slit lamp Bi microscope, Fluorescein staining, and Tear film break-up time. Follow-up was done every 4 weeks, 3 months, and 6 months for 01 years. A purposive sampling technique was used in this study. Data was collected by a pre-designed questionnaire. Data were analyzed using SPSS version 20 (IBM Corp, Armonk, NY, USA) results were compiled in the frequency distribution table. Informed written consent was taken from all participants. Ethical clearance was obtained by the ethical committee of CMH.

Inclusion Criteria

- Patients of > 5 years and <25 years of age
- Patients with a history of ocular allergy for several months
- Patients with a family history of atopy
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Patients of <5 years and > 25 years of age
- Patients with congenital disease
- Patients with other systemic illnesses
- Patients who did not give consent to participate in the study.

RESULTS

Of 110 patients, 80 (72.72%) were male and 30 (27.27%) were female. [Table 1(a) and Table 1(b)] display the age and sex distribution at the onset of VKC; the highest incidence of VKC occurred in the age group 11–15 years that is 45 cases (40.90%). As shown in [Table 2], according to the symptom profile, 80 (72.72%) cases presented with itching while redness was seen in 55 (50.00%) cases and a history of photophobia in 40 cases (36.36%), ropy discharge in 25 cases (22.72%), and watering and burning sensation in 20 cases (18.18%), Foreign body sensation in 55 cases (50%), Constant blinking in 40 cases (36.36%), Lid swelling in 25 cases (22.72%) and Ocular pain in 10 cases (09.09%). The disease pattern of cases as described in [Table 3] depicts palpebral form in 70 cases (63.63%), bulbar form in 15 cases (13.63%), and mixed form in 25 cases (22.72%). [Table 4] describes the presence of various ocular signs in cases examined, 75 cases (68.18%) had papillae on upper palpebral conjunctiva, 45 cases (40.90%) had conjunctival congestion, 10 cases (09.09%) had SPKs and limbal papillae, and 25 cases (22.72%) had Horner tranta's spots and 02 cases(1.81%) had Vernal Shield Ulcer(VSU). The extent of Corneal involvement as shown in [Table 5] occurred in 27(22.72%) patients; 25 patients had minor complications (SPKs) and 2 had major complications (pseudogerontoxon). Vernal

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keratoconjunctivitis association with allergic disease is detected in 40 (36.36%) patients as shown in [Table 6]. [Table 7] shows hematological examination reveals eosinophil counts more than or equal to 6% of the total leucocyte count in 60 cases(56.56%) and [Table 8] shows Fluorescein staining positive in 70 cases (63.63%).

Table 1: Age and sex distribution at the time of presentation (N=110).

Age group (years)	**N**	**%**
5-10	30	27.27
11-15	45	40.90
16-20	25	22.72
21-25	30	09.09
Gender		
Male	80	72.72
Female	30	27.27

[Table 1] shows the age and Sex distribution at the onset of VKC; the highest incidence of VKC occurred in the age group of 11–15 years

Table 2: Clinical Presentation (N=110).

Feature	**N**	**%**
Itching	80	72.72
Redness	55	50.00
Photophobia	40	36.36
Ropy discharge	25	22.72
Burning sensation	20	18.18
Watering	20	18.18
Ocular pain	10	09.09
Foreign body sensation	55	50.00
Lid swelling	25	22.72
Constant blinking	40	36.36

[Table 2] shows 80 (72.72%) cases presented with itching while redness was seen in 55 (50.00%) cases, photophobia in 40 cases (36.36%), ropy discharge in 25 cases (22.72%), watering and burning sensation in 20 cases (18.18%), Ocular pain in 10 cases (09.09%), Foreign body sensation in 55 cases (50%), Constant blinking in 40 cases (36.36%), Lid swelling in 25 cases (22.72%).

Table 3: Disease pattern of the cases (N=110).

Disease pattern	**N**	**%**
Palpebral	70	63.63
Bulbar	15	13.63
Mixed	25	22.72

[Table 3] depicts palpebral form in 70 cases (63.63%), bulbar form in 15 cases (13.63%), and mixed form in 25 cases (22.72%).

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Table 4: Ocular signs in vernal keratoconjunctivitis cases (N=110)

Ocular sign	N	%
Papillae on the upper palpebral conjunctiva	75	68.18
Conjunctival congestion	45	40.90
Limbal papillae	10	09.09
Horner Tranta's spots(TS)	25	22.72
Vernal shield ulcer(VSU)	2	1.81

[Table 4] shows 75 cases (68.18%) had papillae on upper palpebral conjunctiva, 45 cases (40.90%) had conjunctival congestion, 10 cases (09.09%) had SPKs and limbal papillae, and 25 cases (22.72%) had Horner tranta's spots and 02 cases(1.81%) had Vernal shield ulcer(VSU).

Table 5: Extent of Corneal involvement (N=110)

Corneal pathology	N	%
Superficial punctuate keratitis (SPK)	25	22.72
Pseudogerontoxon	02	1.81

[Table 5] shows 25 (22.72%) patients had Superficial punctuate keratitis (SPKs) and 2(1.81%) had Pseudogerontoxon.

Table 6: Vernal keratoconjunctivitis association with allergic disease (N=110)

Association of allergic disorder	N	%
Present	40	36.36
Not Present	70	63.63

[Table 6] shows Patients with VKC often give a history of allergy or atopic diseases such as coexisting allergic conditions could be detected in 40 (36.36%) patients.

Table 7: Haematological profile (N=110)

Blood investigation	N	%
lymphocyte count of more than 40%	50	45.45
Eosinophil counts more than or equal to 6% of the total leucocyte count	60	54.54

[Table 7] shows Blood examination reveals eosinophil counts of more than or equal to 6% of the total leucocyte count in 60 cases(54.54%) and lymphocyte count of more than 40% in 50 cases (45.45%).

Table 8: Eye examination (N=110)

Examination result	N	%
Fluorescein staining present	70	63.63
Tear Film Breakup Time <10 seconds	50	45.45

[Table 8] shows Fluorescein staining positive in 70 cases(63.63%) and Tear Film Breakup Time <=10 seconds in 50 cases (45.45%).

DISCUSSION

The first description of VKC is credited to Arlt who described 3 cases of peri-limbal swelling in

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young patients in 1846. In 1899 Trantas described the limbal white dots that had been previously demonstrated by Horner. In 1908, Gabrielides identified eosinophils in conjunctival inflammation as well of the peripheral blood of VKC patients. In 1910, Trantas characterized the spectrum of corneal changes seen in VKC.[9] VKC is an allergy-associated recurrent inflammatory disease found predominately in prepubertal males. It is characterized by the bilateral presence of palpebral and/or bulbar conjunctiva papillae, keratopathy, mild-to-severe itching, redness, photophobia, etc. VKC is usually considered to be a childhood disease and has been found to resolve normally by the age of puberty. We have observed that 10 cases (09.09%) in our study group were more than 20 years of age. Leonardi et al,[10] in their study reported only 4% of patients to be more than 20 years of age. However, an Indian study by Saboo et al,[11] has reported 12% of patients are above 20 years of age. Male: female ratio in our study was 2.66:1. Most of the studies have reported a male: the female ratio between 4:1 and 2:1.[12] However, a study by Ukponmwan from Nigeria reported a higher ratio of females affected as compared to male (1:1.3).[13] Our study has found a male: female ratio which is within the other studies. VKC is a self-limiting disease and typically lasts 4–10 years with subsidence at puberty. VKC patients have a positive family history of atopy. The immunopathogenesis of VKC is multifactorial. VKC is not only IgE mediate reaction via mast cell release but also activated eosinophils are thought to play a significant role and these can be shown consistently in conjunctival scrapings; However mononuclear cells and neutrophils are also present in VKC patients.CD4 T-helper-2 driven type IV hypersensitivity with immunomodulators such as IL-4, IL-5, and bFGF also plays an important role in VKC patients. The major symptom is itching and other symptoms include photophobia, burning, watering, and a thick, ropy, yellow, mucoid discharge. Clinically, there are three forms of conjunctival reaction: palpebral, limbal, and mixed. The palpebral form is characterized by polygonal, flat-topped, giant cobblestone papillae of the upper tarsal conjunctiva. Many of the cases from our study showed a mixed presentation regarding limbal and palpebral involvement as noted from presenting symptoms and signs. Complications include visual loss due to corneal neovascularization, corneal scars, keratoconus, and steroid-induced cataracts, and glaucoma is found in 6% of patients. 40% of subjects in our study were found to be associated with other allergic diseases. Studies by Lambiase et al,[14] and Bonini et al,[15] reported associated systemic allergies in 41.6% of patients in different series. Pharmacologic therapy is the mainstay of treatment for VKC patients. Topical management is more effective and reasonable than systemic treatment. Conservative management such as cold compresses and lid scrubs make up the first line of therapy. A topical antihistamine may use in mild cases and moderate cases of VKC topical mast cell stabilizers are more effective.[16] If the recurrence is seasonal, mast-cell stabilization therapy be initiated before the season and continued throughout the season. Both H1-blocking agents and mast-cell stabilization have immediate as well as long-term effects. Topical corticosteroids are also the most effective agent in severe cases. Frequent use of corticosteroids and subsequent tapering and use of low-absorption corticosteroids is advised when

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recurrence is more. Supra tarsal injection of local corticosteroids into the upper tarsal papillae may use short-term relief as well.[17] Patients not responding well to steroids can be treated with cyclosporine. Non-steroidal anti-inflammatory eye drops are used as a safe alternative in mild cases. The environmental modification includes avoidance of allergens and aggravating factors, cold compresses, and lid hygiene may help to improve the symptoms and signs. Complications typically arise from occasional corneal scarring and the nonjudicial use of topical corticosteroids. In some cases, symptoms may persist beyond childhood, in which some cases may represent an adult form of atopic keratoconjunctivitis.

Limitations of the Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSIONS

VKC is a recurrent bilateral common form of allergic conjunctivitis and this disease tends to occur more in males at the age of 5 yrs onwards.VKC is relatively common in warm dry climates and often occurs on a seasonal basis, with a pick incidence over late spring and summer. Generally, VKC is a rather benign and self-limiting disease that may resolve with age or spontaneously at puberty. Some cases showed a history of atopy and other allergic conditions.

Recommendation

The clinical course of this disease is usually benign and self-limiting, but a minority of patients will face very debilitating and sight-threatening complications. So, the patients should be treated early according to their severity. Moreover, further studies should be conducted involving a large sample size and multiple centers.

REFERENCES

1. Lambiase A, Minchiotti S, Leonardi A, Secchi AG, Rolando M, Calabria G, et al. Prospective, multicenter demographic and epidemiological study on vernal keratoconjunctivitis: a glimpse of ocular surface in Italian population. Ophthalmic Epidemiol. 2009;16(1):38-41. doi: 10.1080/09286580802573177.
2. Leonardi A. Vernal keratoconjunctivitis: Pathogenesis and treatment. Prog Retin Eye Res. 2002;21:319–39
3. Ali SS, Ansari MZ, Sharif-ul-Hasan K. Featurs of vernal kerato conjunctivitis in a rural population of Karachi. Pak J Ophthalmol. 2006;22:174-7.
4. Bisht R, Goyal A, Thakur, Singh T, Sharma, Vijay, et al Clinico-immunological aspects of vernal catarrh in hilly terrains of Himachal Pradesh. Indian J Ophthalmol. 1992;40:79–82
5. Bonini S, Coassin M, Aronni S, Lambiase A. Vernal keratoconjunctivitis. Eye. 2004;18(4):345-51.
6. Singhal D, Sahay P, Maharana PK, Raj N, Sharma N, Titiyal JS. Vernal keratoconjunctivitis. Surv Ophthalmol. 2019;64(3):289-311.
7. Kumar S. Vernal keratoconjunctivitis: a major review. Acta Ophthalmol. 2009;87(2):133-47.
8. Addis H, Jeng BH. Vernal keratoconjunctivitis. Clin Ophthalmol. 2018:119-23.
9. Buckley RJ. Vernal keratoconjunctivitis. Int Ophthalmol Clin, 1988. 28(4): p. 303-8.
10. Leonardi A, Busca F, Motterle L, Cavarzeran F, Fregona IA, Plebani M, et al. Case series of 406 vernal keratoconjunctivitis patients: a demographic and epidemiological study. Acta Ophthalmol Scand. 2006;84(3):406-10. doi: 10.1111/j.1600-0420.2005.00622.x.
11. Saboo US, Jain M, Reddy JC, Sangwan VS. Demographic and clinical profile of vernal keratoconjunctivitis at a tertiary eye care center in India. Indian J Ophthalmol. 2013;61:486–9.

Annals of International Medical and Dental Research
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12. Tabbara KF. Ocular complications of vernal keratoconjunctivitis. Can J Ophthalmol. 1999;34(2):88-92.
13. Al-Akily SA, Bamashmus MA. Ocular complications of severe vernal keratoconjunctivitis (VKC) in Yemen. Saudi J Ophthalmol. 2011;25(3):291-4. doi: 10.1016/j.sjopt.2011.02.001.
14. Lambiase A, Minchiotti S, Leonardi A, Secchi AG, Rolando M, Calabria G, et al. Prospective, multicenter demographic and epidemiological study on vernal keratoconjunctivitis: A glimpse of ocular surface in Italian population. Ophthalmic Epidemiol. 2009;16:38–41
15. Bonini S, Bonini S, Lambiase A, Marchi S, Pasqualetti P, Zuccaro O, et al. Vernal keratoconjunctivitis revisited: a case series of 195 patients with long-term followup. Ophthalmology. 2000;107(6):1157-63. doi: 10.1016/s0161-6420(00)00092-0.
16. Leonardi A. Management of vernal keratoconjunctivitis. Ophthalmol Ther. 2013;2(2):73-88. doi: 10.1007/s40123-013-0019-y.
17. Holsclaw DS, Whitcher JP, Wong IG, Margolis TP. Supratarsal injection of corticosteroid in the treatment of refractory vernal keratoconjunctivitis. Am J Ophthalmol. 1996;121(3):243-9. doi: 10.1016/s0002-9394(14)70271-5.

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