



To Study the Refractive Errors in Patients of Vernal Keratoconjunctivitis in A Tertiary Health Care Centre (Vindhya Region MP)

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Abstract

Purpose: To evaluate refractive error in VKC patients at tertiary health care centre.

Methods: This prospective observational longitudinal single-Centre study, included 200 eyes of 100 patients with age group 05-20 years with diagnosed VKC. Subjects who satisfy all inclusion criteria and meet no exclusion criteria were included in the study. A written and detailed Informed consent was taken and demographic details of all patients were documented. Best corrected visual acuity was noted and each patient was examined thoroughly with slit lamp.

Results: In the study, the age group 11-15 yr was in majority (49%) followed by 16-20 yr (26%) while 25% cases belong to the age group 5-10 yr. The study included 76 males while 24 were females. In the present study, maximum cases had visual acuity between 6/12 – 6/9 (52%). While the cases with VA 6/6 were 44% and cases with VA 6/24-6/18 were 2% only. Amongst all patients 24% were emmetropic, 39% myopic, 9% hypermetropic and 29% astigmatic. So, myopia was the commonest refractive error while hypermetropia were present in least proportion. In acute type of VKC cases, myopia was present in highest proportion (46.2%) while in chronic cases astigmatism was present in highest proportion (36.1%). Myopia was present in palpebral in maximum proportion ($p=0.447$). Hypermetropia was present in mixed in maximum proportion ($p=0.376$). Astigmatism was present in palpebral in maximum proportion. However, no significant association was found between type of refractive error and VKC type. ($p=0.475$).

Conclusion: Refractive errors are also becoming serious public health problem and are major cause of poor quality of life in children. So, each VKC patient should have proper refraction after diagnosis. There is need for better understanding and management of VKC.

Keywords: VKC, Visual Acuity, Astigmatism, Palpebral, Bulbar.

Introduction

Vernal keratoconjunctivitis (VKC) /Spring catarrh is a chronic, bilateral, although it can occasionally present unilaterally¹ at times asymmetrical,

seasonally exacerbated, allergic inflammation of the ocular surface, involving the lids, conjunctiva (tarsal/bulbar), limbus and the cornea,² with periodic incidence of self-limited character.³The

male predominance in VKC is conspicuous below 20 years of age but after 20 years, male and female ratio almost become equal^{4,5,6}. It is more common and most severe in hot, arid environment such as temperate zones of Mediterranean areas, Central and West Africa, the Middle East, Japan and the Indian subcontinent^{7,8,9}. Patients with VKC have chances of developing refractive errors. Some patients also have family history of atopy, most common atopy being Asthma. Most common presenting symptoms of VKC are itching, redness, photophobia, burning sensation, watering, and a mucinous or ropy discharge^{10,11}. Refractive errors are also becoming serious public health problem and are major cause of poor quality of life in children^{12,13}. So, each VKC patient should have proper refraction after diagnosis. Although several studies have been published on this disease, only few literatures have found the association of VKC with refractive errors. In the present study, we have tried to observe if there is an association between refractive error with types of VKC, its clinical profile and the stages of disease.

Material and Method

This prospective observational longitudinal single- centre study a total of 200 eyes of 100 patients with VKC attending the out-patient department of Ophthalmology Department of S.S. Medical College and associated Gandhi Memorial Hospital, Rewa (M.P.) fulfilling the following criteria were enrolled in the study.

Inclusion Criteria

1. All cases of vernal keratoconjunctivitis.
2. Patients willing to sign consent.

Exclusion Criteria

1. Patients below 5 years of age.
2. Patients with previous history of drug instillation.
3. Any patient with ocular trauma and surgery.
4. Contact lens wearers.

Other ocular disorders like glaucoma and blepharitis.

Data Collection Method

Subjects who satisfy all inclusion criteria and meet no exclusion criteria were included in the study. A written and detailed Informed consent was taken and demographic details of all patients were documented. The purpose of study was explained to the subjects and their parents in cases of minority of subject's age and confidentiality was assured.

Ocular Examination

Then ocular examination of both eyes of all subjects was started under the following headings including:

Visual Acuity

Assessment of visual acuity with snellen's visual acuity chart, Landolt's C-Chart in an adequately lighted room. The visual acuity was measured with self-illuminated Snellen's chart at a distance of 6 meters in a room with lighting intensity between 50–100 foot-candles. Visual acuity was determined in the unaided eye (without spectacles or contact lenses) of the subject in sitting position with the other eye being covered with an eye patch.

Slit Lamp Bio-Microscopy

Slit lamp examination for anterior segment evaluation for perilimbal pigmentation, bulbar hyperaemia, and tarsal papillae, also fluorescein staining was performed with slit lamp bio-microscopy to detect any epithelial erosions, keratitis, or shield ulcers.

Refraction:

Cycloplegic refraction and astigmatism were recorded.

Autorefractometry

Autorefractometry (ARK) in all patients of VKC was done with Shin Nippon Autorefractometer.

Fundus Examination:

Fundus examination was done with 90D Lens and Indirect Ophthalmoscopy.

Statistical Analysis Plan

1. The collected data was fed in computer in MS Excel sheet and an individual master chart was prepared for each group for analysis.

2. Graph pad instat software was employed for the statistical analysis in which unpaired t-test and Chi square was applied to compare the two groups and thus the probability (p) value was procured. ‘p’

value indicates how likely it is that a result has occurred by chance alone.

3. Smaller the ‘p’ value more is the significance of a test and so a ‘p’ value of < 0.05 or < 5% is taken as statistically significant.

Results

Table 1: Age and gender distribution of the patients

Age group in years	Male		Female		Total	
	No of cases	%	No of cases	%	No of cases	%
5-10 yr	19	19.0%	06	06.0%	25	29.0%
11-15 yr	38	38.0%	11	11.0%	49	49.0%
16-20 yr	19	19.0%	07	07.0%	26	26.0%
Total	76	76.0%	24	24.0%	100	100.0%

Table 1 depicts the Age and gender distribution of the patients. In the study, the age group 11-15 yr was in majority (49%) followed by 16-20 yr

(26%) while 25% cases belong to the age group 5-10 yr. The study included 76 males while 24 were females.

Table 2: Visual acuity at the time of presentation

VA	No. of Eyes	%
6/24 - 6/18	4	2.0
6/12 - 6/9	108	52.0
6/6	88	44.0
Total	200	100.0

Table 2 depicts the visual acuity at the time of presentation In the study, maximum cases had visual acuity between 6/12 – 6/9 (52%). While the

cases with VA 6/6 were 44% and cases with VA 6/24-6/18 were 2% only.

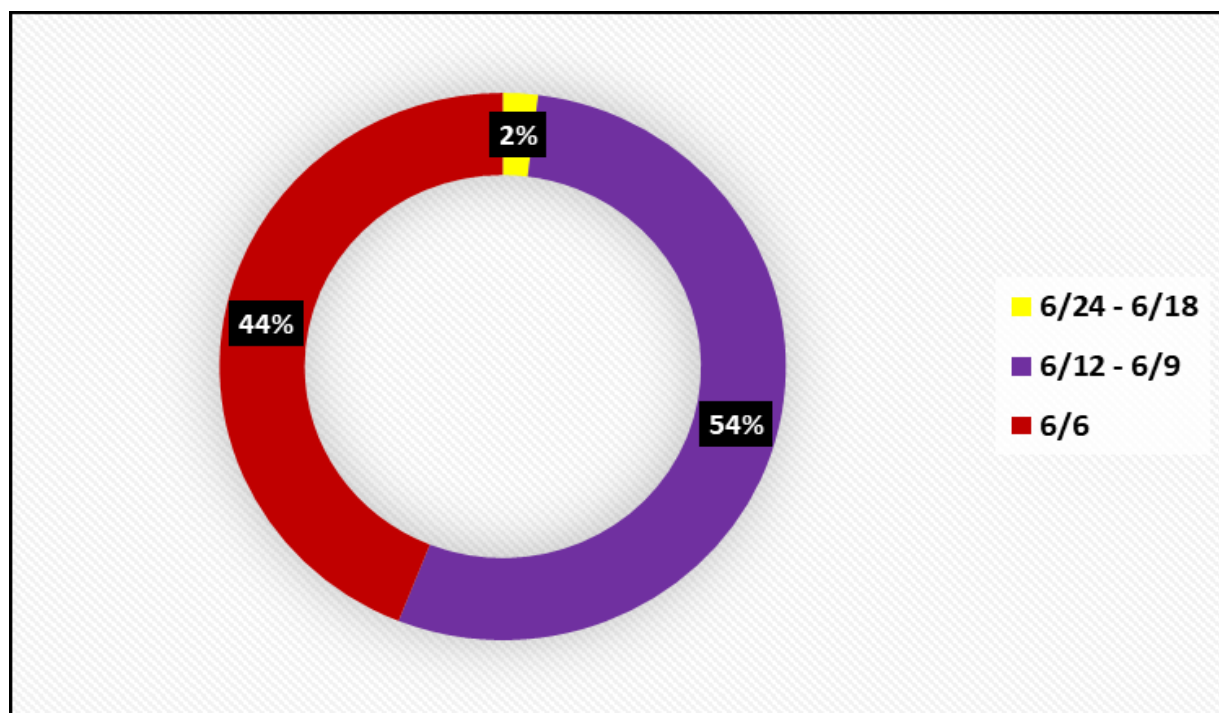


Table 3: Distribution of refractive error in VKC patients

Refraction	No. of Cases	%
Emmetropia	44	44.0
Myopia	28	28.0
Hypermetropia	9	9.0
Astigmatism	19	19.0
Total	100	100

Table 3 depicts the distribution of refractive error in VKC patients. Emmetropia was found in 44% cases, myopia in 28% cases, hypermetropia in 9%

cases and astigmatism in 19% cases. So, myopia was the most frequent refractive error while hypermetropia were present in least proportion.

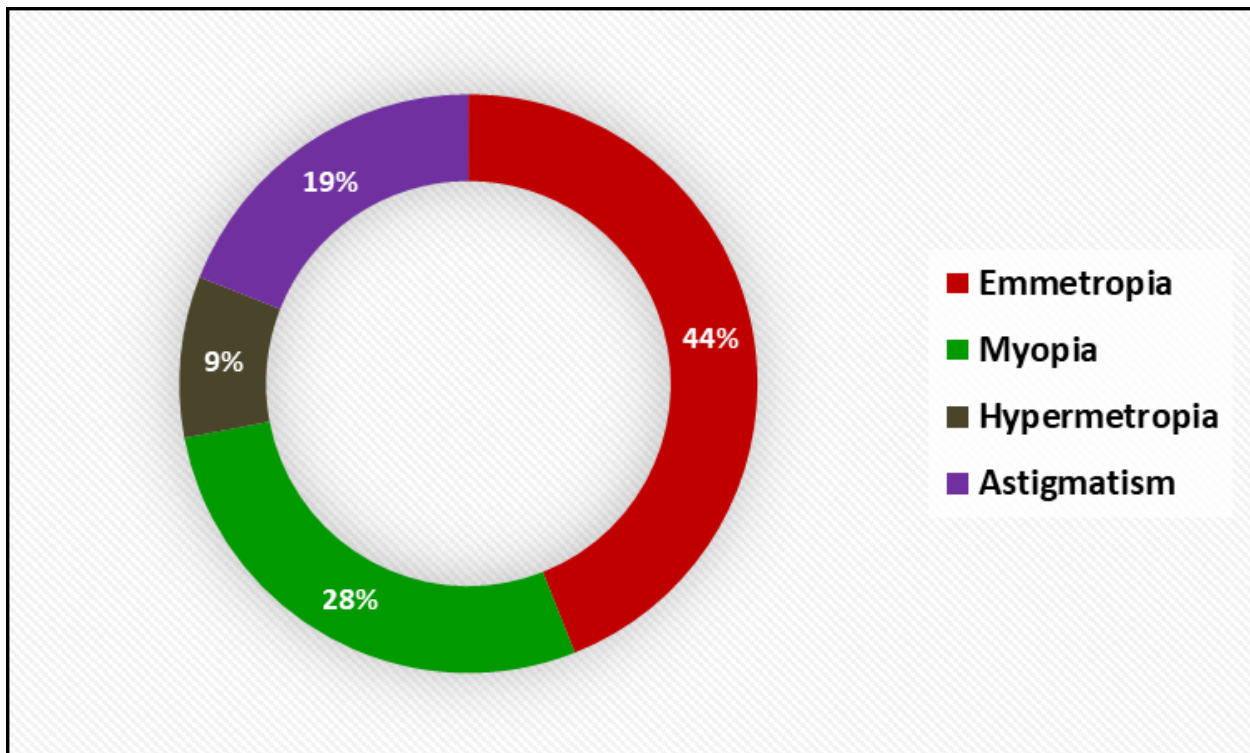


Table 4: Association of VKC Stages with Refractive error

Refractive Error	VKC Stage				Total		chi sq	p-value
	Acute		Chronic		No.	%		
	No.	%	No.	%				
Emmetropia	24	25.60%	20	23.00%	44	24.00%	8.44	0.038
Myopia	8	46.20%	20	34.40%	28	39.00%		
Hypermetropia	3	10.30%	6	8.20%	9	9.00%		
Astigmatism	4	17.90%	15	36.10%	19	29.00%		

Table 4 depicts the Association of VKC with Refractive error. It was observed that though in acute type of VKC cases, Myopia was present in highest proportion (46.2%) while in chronic cases

Astigmatism was present in highest proportion (36.1%). The significant association was found between refractive error types and VKC stage. (p=0.038).

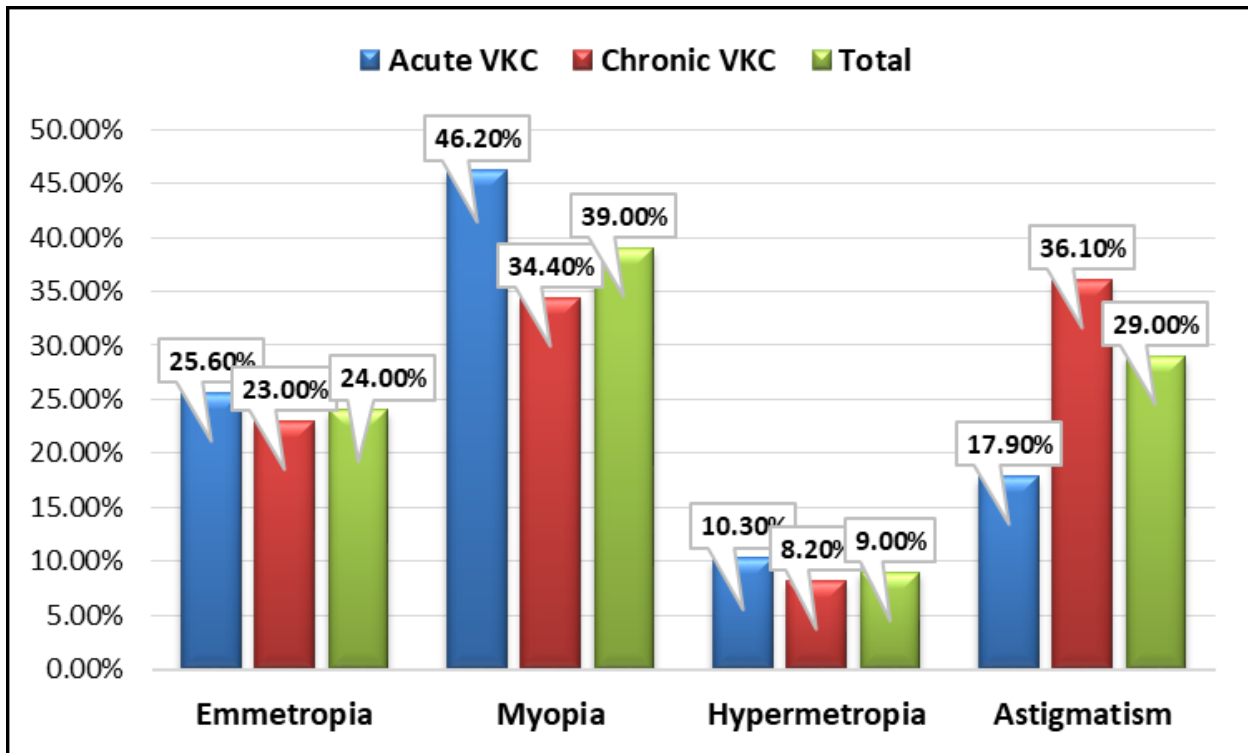


Table 5: Association of VKC type with Refractive error

Type of Refractive error	VKC types						Total		chi sq	p-value
	Palpebral		Bulbar		Mixed		No.	%		
	No.	%	No.	%	No.	%				
Emmetropia	24	18.6%	9	50.0%	11	20.0%	44	24.0%	3.12	0.475
Myopia	17	42.4%	5	25.0%	6	40.0%	28	39.0%		
Hypermetropia	6	10.2%	0	0.0%	3	12.0%	9	9.0%		
Astigmatism	12	30.5%	2	25.0%	5	28.0%	19	29.0%		
Total	59	100%	16	100%	25	100%	100	100%		

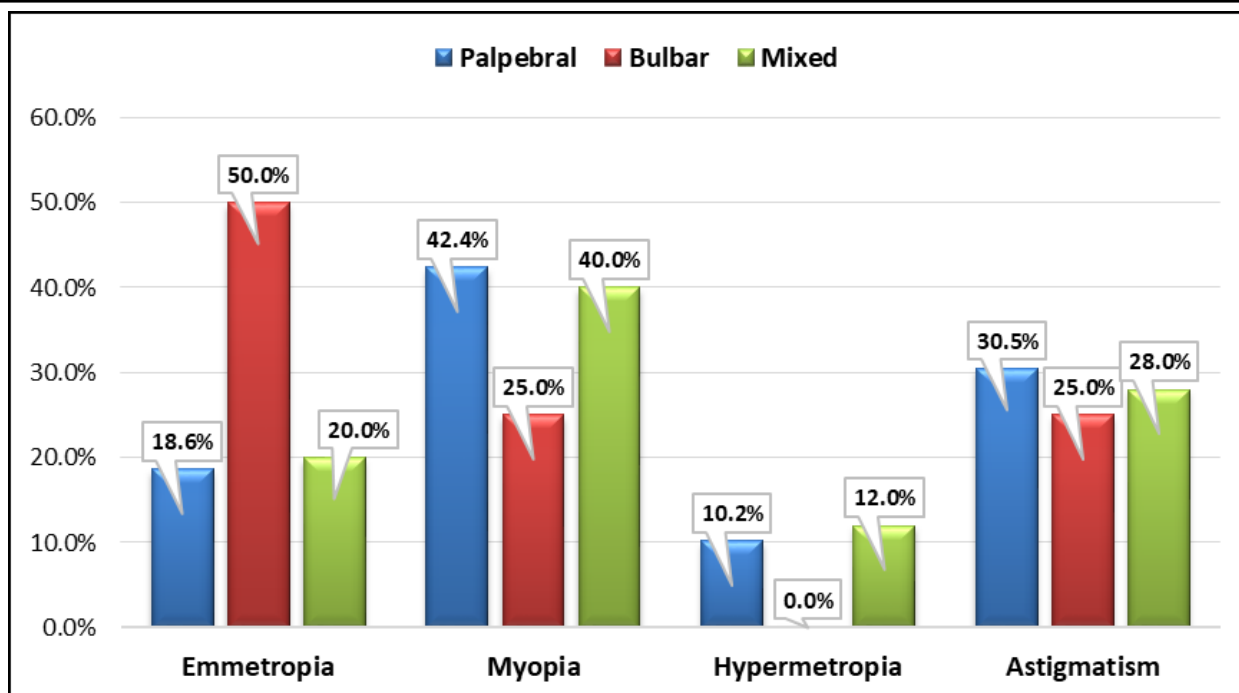
Table 5 depicts the Association of VKC type with refractive error. It was observed that Emmetropia was present in bulbar form of VKC in maximum proportion.

Myopia was present in palpebral in maximum proportion (p=0.447).

Hypermetropia was present in mixed in maximum proportion (p=0.376).

Astigmatism was presented in palpebral in maximum proportion.

However, no significant association was found between type of refractive error and VKC type. (p=0.475).



Discussion

Distribution in accordance with age:

In our study total 100 patients were enrolled. The age group considered in our study was 5 to 20 years. The mean age of presentation was 12 (mean 10 ± 2.5 years) years with maximum subjects were in the age group of 11-15 years. It is similar to the other studies conducted by **Saleh et al¹⁴** in 2011 at Yemen Saudi Arabia (9 ± 3.0) years, **Shaikh et al¹⁵** in 2001 at Pakistan (mean 10 ± 2.0 years) and **Bonini et al¹⁶** in 2000 at Rome Italy (7.1 ± 4.7 years), **Leonardi et al¹⁷** in 2006 at Italy (7.0 ± 5.0 years), **Niharika Shetty et al¹⁸** in 2019 at Tumakuru Karnataka (10 ± 2.0 years) all these studies also found mean age of presentation was 6-15 years.

Distribution in accordance with visual acuity at presentation:

In present study out of 100 patients we had 52% patients with visual acuity (VA) ranging between 6/12-6/9 mild vision loss, 2% patients were having moderate vision loss while 44% were having visual acuity 6/6. **Ujwala SS et al¹⁹** in 2012 at Hyderabad reported slightly higher 88% patients with mild vision loss, 8% moderate vision loss and 4% with severe vision loss.

Distribution of refractive error in vkc patients:

In present study myopia was the commonest refractive error (28%) followed by astigmatism (19%) and hypermetropia (9%) associated with VKC.

Contradictory to above study, **Niharika KS et al¹⁸** in 2018 at Karnataka observed hypermetropia (48%) as the commonest associated refractive error, followed by myopia (38%) and astigmatism (14%). While **Tahir T et al²⁰** in 2013 at Pakistan found astigmatism as the commonest associated refractive error 22 (55%) out of 50 patients, 10 (25%) myopia and 8 (20%) hypermetropia.

Association of vkc stages with refractive error:

It was observed that though in acute type of VKC cases, Myopia was present in highest proportion (46.2%) while in chronic cases Astigmatism was present in highest proportion (36.1%). Significant association was found between refractive error types and VKC stage. ($p > 0.038$)

In a contradictory study conducted by **Niharika KS et al¹⁸** in which in acute stage myopia was present in higher percent (41.67) while in chronic stage astigmatism was in highest proportion (50%). No Significant association was found between refractive error types and VKC stages. ($p > 0.087$)

Association of vkc type with refractive error:

In present study it was observed that emmetropia was present in bulbar form of VKC in maximum proportion.

Myopia was present in palpebral in maximum proportion (42.4%) ($p=0.447$).

Myopia was present in mixed in maximum proportion (40.0%) ($p=0.376$).

Astigmatism and myopia were in same proportion each 25% in bulbar form.

However, no significant association was found between type of refractive error and VKC type. ($p=0.475$).

Contradictory to this, study conducted by **Niharika KS et al**¹⁸ they found that 42.11% myopes had bulbar VKC and 44.74% of the hyperopes had bulbar VKC. However, in 2018 at India, shown that 34.21% bulbar form does not have any type of astigmatism and another 34.21% patients with bulbar form had mixed astigmatism. Palpebral type showed maximum patients with no astigmatism.

Conclusion

Thus to conclude the prevalence of vernal keratoconjunctivitis among children in the tropical country like India (**Vindhya region MP**) was high which indicate that it is a serious health issue in our region. VKC patients experiences significant ocular morbidity, which affects the quality of life. Refractive errors are also becoming serious public health problem and are major cause of poor quality of life in children. So, each VKC patient should have proper refraction after diagnosis. There is need for better understanding and management of VKC.

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