

# FREQUENCY OF DIFFERENT TYPES OF VERNAL KERATOCONJUNCTIVITIS IN PATIENTS PRESENTING A TERTIARY CARE HOSPITAL

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## ABSTRACT

**Objective:** To determine the frequency of different types of vernal kerato-conjunctivitis presenting to ophthalmology department of Hayatabad Medical Complex, Peshawar.

**Methodology:** This was a cross sectional study. A total of 165 patients were examined through slit lamp and diagnosed as vernal kerato-conjunctivitis on the basis of pre-determined criteria. After diagnosis, they were classified into three types. Percentages were calculated for the types of vernal kerato-conjunctivitis in each group. Data was stratified among different age groups and gender. Chi-squared test was used to calculate the significance for categorical variables.

**Results:** Out of 165 patients, 105 were male and 60 were female. Age ranged from 5-16 years with mean and SD of  $9 \pm 2.8$  years. Average duration of symptoms was  $4 \pm 1.6$  years. Age group of 9-12 years had highest number of patients which was 66 (40%) while the lowest number of patients were observed in age group 13-16 years that was 41 (25%). Palpebral vernal kerato-conjunctivitis was the most frequent type of kerato-conjunctivitis seen in 47%, limbal was 30% and mixed type was seen in 23%.

**Conclusion:** Vernal kerato-conjunctivitis was more frequent in male gender while palpebral type was the most common presentation in our studied population.

**Key Words:** Vernal keratoconjunctivitis, Horner-Trantas dots, Conjunctival papillae, Allergens

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## INTRODUCTION

Vernal keratoconjunctivitis (VKC) is a disease affecting both eyes simultaneously, occurs periodically and is an allergic inflammatory response of the conjunctiva and cornea to different substances. This disease has recurrent seasonal hyperactivity. Its pathogenesis is type 1 hypersensitivity reaction which usually develops within a limited time span when exposed to an allergen. The diseased patients are usually allergic to a number of constituents, these include pollen from flowers, animal dander, molds and mites etc<sup>1</sup>. Higher incidence of VKC is found in hot and dry climate. It is a common disease in South Asia, central Africa and South America<sup>2</sup>. The reported incidence of VKC in Asian and African population is estimated to be around 5% of the total pediatric age group<sup>3</sup>.

The disease has been classified into three types; the palpebral VKC which presents with giant papillae on the

tarsal conjunctiva of the lids, the limbal VKC which has Horner-Trantas dots at the limbus and the mixed VKC which has characteristics of both the types. The terms given to them are palpebral, limbal, and mixed respectively<sup>4-5</sup>. The disease presentation includes severe itching, photophobia, red eyes and thick mucus discharge<sup>6</sup>. On examination, there is conjunctival chemosis or swelling of the eyelids, tenacious mucus discharge and giant papillary conjunctivitis which may give the appearance of cobblestone. The giant papillae can be seen on the upper tarsal conjunctiva when the upper eyelid is averted under slit lamp examination while papillae can also be seen around the limbus. The appearance of the papillae in the form of cobblestone is regarded as a characteristic of palpebral VKC<sup>7</sup>. VKC is associated with both disease and treatment related ocular complications which may be severe and vision-threatening. These complications may include epithelial macro-erosions, shield ulcers, plaques, scarring, keratoconus or pseudo-gerontoxon.

Treatment related complications include steroid induced glaucoma, cataracts and persistent epithelial defects<sup>8</sup>.

VKC is a worldwide disease which involves patients in pediatric age group. It poses a great health care challenge to our population considering the environmental and other predisposing factors. Children with severe VKC may have a poor quality of life because of limitations in daily activities, schooling, and vacationing as well as potential psychological and relationship issues<sup>9</sup>. VKC has a significant morbidity and the disease has acute exacerbations and remissions which are of episodic nature<sup>10</sup>. So if the disease is not treated properly, the complications are very grievous. The risk of corneal involvement also varies significantly among the different types of VKC, with palpebral and mixed types having greater risk of corneal involvement<sup>11</sup>. Severity of the disease and involvement of the cornea warrants different approach to treatment of the patients<sup>12</sup>.

To our knowledge, there is paucity of literature on the different types of VKC in our population. Literature has also shown the incidence of different types to be varying in different population study groups<sup>4, 13-14</sup>. It is thus pertinent to know the disease load and its types. This study aims to help us better understand the nature of the disease, the predisposed patients, and its demography. It will enhance our knowledge of the disease, generate local evidence and will lead to better sensitization of the predisposed population and more vigilance on part of the treating physician. This study also intends to detect various types including palpebral type which is mostly associated with corneal complications.

## METHODOLOGY

This cross sectional study was conducted at the Department of clinical ophthalmology, Medical Teaching Institute, Hayatabad Medical Complex, Peshawar from January, 2019 to June, 2019. Using "Open EPI", taking prevalence of palpebral VKC as 12.2 %<sup>10</sup>, keeping 95% confidence level and 5% margin of error, the sample size was calculated to be 165 patients. Non probability consecutive sampling technique was employed for enrolment of patients. Inclusion criteria were patients with VKC aged 5 to 16 years. Patients having bacterial or viral conjunctivitis, previous history of ocular trauma and drug allergy were excluded. Palpebral VKC was defined as presence of at least one papillae more than 1 mm in diameter on the upper tarsal conjunctiva, not involving the limbal conjunctiva, with complaints of itching sensation and/or one of the symptoms as; redness, foreign body sensation, watering, mucoid discharge and photophobia in the last six months<sup>15</sup>. Limbal VKC was defined as presence of thickened limbal conjunctiva along with opacification, raised gelatinous excrescences at limbus along with whitish Horner-Trantas dots and/or at least one of the following; redness, foreign body sensation,

watering, mucoid discharge and photophobia in the last six months<sup>15</sup>. The patient was termed as having mixed VKC if both the features of palpebral and limbal VKC were present<sup>15</sup>.

Hospital ethics committee approval was obtained before commencing the research. All patients meeting the inclusion criteria were enrolled in the study through OPD and emergency. Detailed history was taken from the patients. They were examined under slit-lamp for the signs of different types of VKC. Patients were then grouped into three classes of VKC on the basis of above mentioned criteria. The purpose and benefits of the study were explained to the patients and informed consent was obtained from each patient.

All the data was entered in a predesigned proforma. Data was analyzed using SPSS software version 20.0. Frequencies and percentages were computed for categorical variables like gender and type of VKC. Mean  $\pm$  standard deviation was computed for numeric variables like age. Types of VKC were stratified among age and gender to see significance and effect modifiers and the results were presented in the form of tables and graphs.

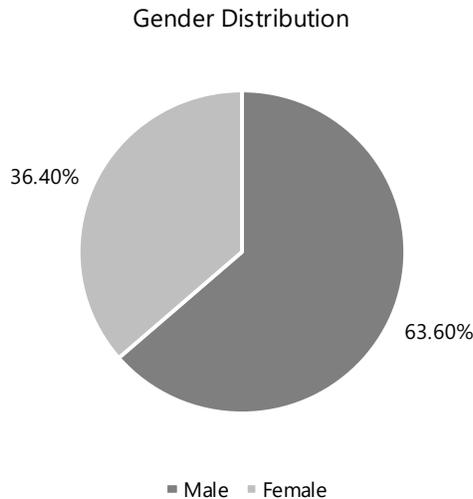
## RESULTS

One hundred and five patients were males and 60 were females (Figure 1). Male gender was more affected than female with ratio of 1.75:1. Age range was 5-16 years with mean  $\pm$  SD as  $\pm$  2.8 years. Highest number of patients were in age group 9-12 years while lowest number of patients were seen in age group 13-16 years (Table 1). Mean duration of symptoms was  $4 \pm 1.6$  years. Palpebral VKC was the dominant type of VKC accounting for 47% of the studied population (Table 2). Gender wise stratification of types of VKC showed no difference (Table 3). Age wise stratification of type of VKC also showed no difference with respect to age-group of the patient (Table 4).

## DISCUSSION

In our study, 64% of the patients were male and 26 % were female, which is consistent with most of the studies. In a population based study by Marey HM. et al., male to female ratio was 2.3: 1 in children affected by VKC<sup>16</sup>. Duke et al. found no statistically significant difference as far as the gender of the patients was concerned, though clinically males were more affected than females<sup>17</sup>. However, Ukponmwan reported a higher ratio of females affected by VKC in comparison to males in a study from Nigeria<sup>18</sup>.

The mean age of patients in our study was  $9 + 2.8$  years. Khan MR et al. reported mean age of  $9.10 \pm 3.90$  years in a similar study<sup>19</sup>. In our study, the age group most frequently affected was 9-12 years accounting for 40 % of the total population. In a similar study, VKC oc-



**Figure 1: Distribution of gender**

**Table 1: Distribution of age**

Age Group	Frequency	Percentage
5-8 years	58	35%
9-12 years	66	40%
13-16 years	41	25%
Total	165	100%

**Table 2: Frequency of types of VKC**

Types of VKC	Frequency	Percentage
Palpebral VKC	78	47%
Limbal VKC	49	30%
Mixed VKC	38	23%
Total	165	100%

curred most commonly in age-group 11-15 years<sup>20</sup>. Hay-ilu D et al. reported that the most commonly affected age group was 6-10 years<sup>21</sup>. It is thus clearly evident that children of school going age group are predominantly affected by this disease. This might be owing to the increased amount of time spent outdoors, thus exposing them to environmental risk factors such as allergens and ultraviolet light.

In our study palpebral VKC (47%) was more prevalent, followed by limbal (30%) and then mixed VKC (23%). The incidence of different types of VKC varies among different studied population. Similar type of research done by Rajappa SA et al. determined that 49% patients constitute palpebral disease, 27% were having limbal type of the disease and the mixed form was found in 24% of the patients<sup>14</sup>. AM Zicari et al. reported the disease pattern as palpebral VKC 71%, mixed type of VKC 29% and no patient in the limbal group<sup>4</sup>. However, a research done by Fekadu Kassahun and Abebe Bejiga indicated

different percentages of different types of VKC<sup>10</sup>. A similar study was performed by Leonardi A. et al. and they showed that 48% of the patients were having the limbal type of VKC, 33% were diagnosed with the palpebral form of VKC while 19% of the patients were having the mixed disease<sup>13</sup>. Genetic predisposition and different environmental conditions might be responsible for the variations in prevalence of the different types of VKC.

Gender wise stratification of types of VKC showed no difference with P value of 0.993 in our study. Tuft SJ, however, reported that female gender was significantly affected by limbal type of VKC with P value of 0.015<sup>22</sup>. Al-Akily SA et al. also found females to be more affected by limbal VKC (58.7%) as compared to males (44.7%)<sup>23</sup>.

There are few limitations of the study. The patients' examination was performed by a single researcher and since the diagnosis is clinical, there are few other diseases which may have some of the features of the VKC,

thus there might have been overlap with perennial and seasonal allergic conjunctivitis, rhinoconjunctivitis, giant papillary conjunctivitis and atopic keratoconjunctivitis. Another limitation was the lack of classification of VKC based on the severity of the disease. It would be pertinent to further study the role of various risk factors in the pathogenesis of the disease. Lastly, one limitation of the study may be that only patients presenting to hospital OPD were considered.

## CONCLUSION

VKC is a common disorder affecting children in their early years of life. It may affect either gender yet it is more predominant in the young males. Palpebral type is the most frequent type of VKC in our studied population.

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## CONTRIBUTORS

MI conceived the idea, wrote initial manuscript, collected data and finalized the draft. SARK and WJ helped correction of the proposal, literature search, data collection, interpretation and overall supervision of the project. Z and KK provided technical support, helped in data interpretation and provided expert guidance where needed. All authors contributed significantly to the submitted manuscript.