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# Comparative Study of Growth of Eyelashes in Patients with Vernal Keratoconjunctivitis and Normal Population

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***Abstract:*** *The aim of the study is to compare the eyelash length of patients with vernal keratoconjunctivitis with normal population and determine if eyelash length is dependent on different variables as in age,sex, type of VKC and duration of disease.*

***Key Words:*** *VKC=Vernal keratoconjunctivitis, SICS= Small Inscion Cataract Surgery*

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## I. Materials And Methods

A total of 100 patients between the age group of 5-20 years of age with signs and symptoms of VKC who attended the OPD, ophthalmology department of NMCH Patna between the March 2018 and March 2020 were selected and included in our study.Careful history of each patient was taken (history of systemic illness or other ocular illness).One age and gender matched control subject was selected for each VKC patient from NMCH Patna (Department of Ophthalmology) OPD.The controls did not suffer any ocular disorders nor they had any history of ocular disorders**.**

SOURCE OF DATA-Patients attending department of ophthalmology OPD at NMCH, Patna.
Methods of collection of data-

**Criteria of inclusion:**

1.Patients had presenting features of VKC.
2.Healthy patients as control.
3.Both sexes.
4.Age group 5-20 years.

**Exclusion criteria -** 1.Subjects designated as controls must never have had any ocular allergic disease.

History, clinical form ,type of presentation and duration of illness was evaluated. Each patient was evaluated to distinguish among bulbar, palpebral and mixed forms.The patients were dividedinto age groups and duration of signs and symptoms and the month of presentation was noted.The signs included palpebral and bulbar conjunctival hyperaemia ,conjunctival chemosis ,limbal gelatinous thickening ,papillae ,cobblestone appearance ,muddy discoloration of conjunctiva and horner tranta spot.

Upper eyelash length was measured with SICScaliper. Theeyelashes measurement was taken .A total of four measurements was taken and the mean calculated .The final result was expressed as the mean value of the overall 4 measurements for each patient or control subject.

**STASTICAL ANAYLSIS**

All data were elaborated using a commercially available statistical computer software package .All data have been summarized as frequency tables and percentages have been worked out. A t test was used for the comparison of means. Linear regression was used to study the correlation between the eyelash length and the single variables. The validity of the regression models was checked by verifying the assumptions of linear regression. P less than .05 was considered statistically significant.

## II. Discussion:

We found that the upper eyelashes in VKC patients were significantly longer than in age- and gender- matched control subjects.

Each human eyelash lives an average of 5 to 6 months. The growth phase of the hair follicle and terminal hair (anagen) lasts 2 to 3 months. At the end of the eyelash growth, a brief transition stage of 2 to 3 weeks follows (catagen), with shortening of the hair follicle. Finally, the follicle enters a resting phase (telogen) of 2 to 3 months, leading to the detachment of the eyelash. Approximately 60% to 80% of the eyelashes are in the anagen phase

Several growth factors are involved with hair follicle growth and cycling. Androgens are the principal hormones that control sexual hair growth by receptors localized in the dermal papilla, but eyelashes seem not to be sensitive. Retinoic acid derivatives affect the hair growth cycle in mice by increasing the length of the anagen phase, and insulin-like growth factor-I slows the hair cycle entry in the catagen phase; growth hormone, insulin, glucocorticoids, and prolactin are also implicated, but there is no evidence to support an involvement of these hormones in eyelash growth.

Excessive growth of eyelashes (trichomegaly) has been reported in some congenital and acquired conditions. Familial trichomegaly was described recently. Rare cases of congenital trichomegaly with pigmentary degeneration of the retina and growth retardation were described (Oliver-McFarlane syndrome). Acquired lengthening of the eyelashes is of the cutaneous manifestation of HIV infection. It has been reported in adults and pediatric patients. Possible mechanisms have been suggested: a direct action of some viral proteins to epidermal keratinocytes and pilosebaceous structures, highserum levels of interferon, and, in some cases, zidovudine therapy. An unexplained lengthening of eyelashes has been reported in a 20-year-old womanwith dermatomyositis and in a 14-year-old girl with systemic lupus erythematosus

Topical latanoprost, an analog of prostaglandin F2 used to reduce the ocular pressure, has been showed to increased number, length, thickness, curvature, and pigmentation of eyelashes in a series of patients. The ability of prostaglandin F2 and analogues to act as a growth factor or mitogen may explain the altered growth pattern of eyelashes in these patients.

Trichomegaly developed after treatment with interferons in patients with chronic hepatitis, B-cell lymphoma, chronic granulocytic leukemia, and cutaneous melanoma.

Four patients showed eyelash hypertrichosis after 3 to 4 months of treatment with systemic cyclosporine. They had received renal allograft (2 patients) or liver allograft (1 patient) or experienced severe thrombocytopenia (1 patient). Cyclosporine may induce resting follicles to enter an active growth phase. However, trichomegaly was not observed in a group of 51 renal transplant recipients who were treated with systemic cyclosporine

Eyelash lengthening was described recently in a patient who had colon cancer and was treated with cetuximab, a chimeric antibody against the epidermal growth factor receptor. Epidermal growth factor receptors are located in hair follicles, and their inhibition may result in increased terminal differentiation, causing trichomegaly

Trichomegaly was described recently in 6% of 240 patients with congenital heart disease. Other causes of elongation of eyelashes have been reported: porphyria; malnutrition; anorexia nervosa; hypothyroidism; pregnancy; and medications such as diazoxide, streptomycin, minoxidil, phenytoin, psoralen, and penicillamine. The current study was performed on 100 VKC patients who were matched with 100 age and gender matched controls.The eyelash length of patients and controls was measured using SICS caliper.Duration of disease was taken into account.The patients were divided into age groups.Eyelash length was measured in different groups.The study was conducted for a period of around 2 years.

**LENGTH OF EYELASHES IN VKC PATIENTS AND CONTROLS**

Length of eyelashes in VKC patients was found to be significantly larger than those in normal controls.Length of eyelash in VKC patients was found to be 9.3mm±0.5 and that in controls was found to be 8.3mm±0.8.The p-value was found to indicate that the difference was significant.

**Table-1** Length of Eyelashes

| Patient | Control |
|---|---|
| **9.3mm±0.5** | **8.3mm±0.8** |

According to the study conducted by Neri Pucci and Enrico Lombardi the length of eyelash in vkc patient was 8.9mm±1.17 and length in controls was 7.9mm±1.07. Patients with VKC had longer eyelashes than healthy matched subjects. The ocular inflammation, by unknown chemical mediators, was likely responsible for the excessive eyelash growth. The finding may represent a defensive mechanism against physical agents that might have a crucial role in the etiopathogenesis of this disease. Among the chemical mediators that contribute to the pathogenesis of ocular inflammation in VKC, b-FGF and s-P have been shown to induce positive effects on hair growth in animal models and

humans. The expression of b-FGF, as well as other growth factors, by immunostaining increased significantly in VKC epithelial cells, mast cells, and blood vessel endothelial cells when compared with control samples.

**EFFECT OF TYPE OF VKC ON EYELASH LENGTH**

In our study the length of eyelashes in bulbar, palpebral and mixed variety of VKC patients was found to be 9.25mm±0.53, 9.34mm±0.50 and 9.30mm±0.48 and number of patients of three different type of VKC were 48, 22 and 30respectively. The p-value was found to be 0.867 which indicates that length of eyelashes is not dependent on type of VKC.

In study conducted by Pucci and Lombardi the length of eyelashes in bulbar, palpebral and mixed VKC was found to be 8.50mm±0.0, 8.99mm±1.13 and 8.83mm±1.27.The p-value was found to be 0.46 which also indicates that length of eyelashes was not dependent on type of VKC.

**EFFECT OF GENDER ON EYELASH LENGTH**

The ratio of males and females in our study was approximately 3:1 with number of males being 74 and number of females being 26.Length of eyelashes in male and female VKC patients in our study was found to be 9.2mm±0.4 and 9.5mm±0.7.The p-value was found to be 0.120 indicating that length of eyelashes in VKC patients is not affected by sex.

According to the study by Pucci and Lombardi the length of eyelashes in male and female patients were 9.0mm±1.17 and8.67mm±1.17.The p-value was found to be 0.22 which again indicates that length of eyelashes is independent of sex.The ratio of males and females in their study was 2.55:1.

**EFFECT OF DURATION OF DISEASE ON EYELASH LENGTH**

Length of eyelashes in VKC patients was also measured after dividing them on the basis of duration of disease.Patients having disease history of less than 1 year had mean eyelash length of 9.31mm±0.563 and number of such patients amounted to 64. Patients having disease history of one to two years had mean eyelash length of 9.24mm±0.309 and number of such patients amounted to 20.Patients having disease history of two to three years had mean eyelash length of 9.20mm±0.2 and number of such patients amounted to 10.Patients having disease history of three to four years had mean eyelash length of 9.33mm±0.907 and number of such patients amounted to 6.The p-value was found to be 0.867.Hence no relation was found to be presentbetween duration of disease and eyelash length.

According to the study conducted by Pucci and Lambardi the p-value was found to be 0.64.Hence this study also showed that there is no relation between growth of eyelashes and duration of illness.

**EFFECT OF AGE ON EYELASH LENGTH**

The patients were divided into age groups and eyelash length was measured.The patients in age group five to ten years had mean eyelash length 9.37mm±0.46 and number of patients in this age group in our study were 24.The patients in age group 11-15 years had mean eyelash length 9.30mm±0.53 and number of patients in this age group in our study were 60.The patients in age group 16-20 years had mean eyelash length 9.13mm±0.53 and number of patients in this age group in our study were 16.The p-value was found to be 0.578.Thus the eyelash length in patients is not dependent on age.

According to the study done by Pucci and Lombardi age did not have any effect on eyelash length.

## III. Conclusion:

Thus the length of eyelashes in VKC patients was indeed found to be significantly larger than the control group.The ocular inflammation by unknown chemical mediators may have resulted in growth of eyelashes.Age,gender,duration of disease and type of VKC did not seem to have any effect on the length of eyelashes.

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