

Effectiveness of Supratarsal Triamcinolone Injection in Patients with Vernal Keratoconjunctivitis

Sher Akbar Khan, Tajbar Khan, Mubashir Rahman, Mir Ali Shah

Pak J Ophthalmol 2015, Vol. 31 No. 2

See end of article for authors affiliations

Correspondence to:
Sher Akbar Khan
Vitreoretinal fellows,
Department of Ophthalmology,
Lady Reading Hospital
Peshawar

Purpose: To determine the efficacy of supratarsal injection of triamcinolone acetate amongst patients with vernal keratoconjunctivitis.

Material and Methods: It was descriptive case series study conducted in the Department of Ophthalmology, Lady Reading Hospital Peshawar in 6 months from 6th February to 6th July, 2012. A total of 196 patients with vernal keratoconjunctivitis were subjected to supratarsal injection of triamcinolone acetate. To determine the effectiveness, all patients were followed after two weeks of supratarsal injection of triamcinolone acetate for the complete disappearance of papillae and those patients in whom there was complete disappearance of the papillae were followed for the next three months for recurrence of the papillae. Data was analyzed by Statistical Package for Social Sciences (SPSS) version 10.0 and presented in the form of tables and graphs.

Results: There were total of 196 patients comprising of 130 (66.33%) males and 66 (33.67%) females with an overall mean age of 15.23 ± 5.79 SD. Maximum patients i.e. 130 (66.33%) were from the age group of 11 to 20 years. The supratarsal triamcinolone acetate injection was effective in 170 (86.73%) patients including 123 (61.18%) males and 47 (27.65%) females. No recurrence of the papillae was noted in any of the patients when followed for further three months time.

Conclusion: Supratarsal injection of Triamcinolone acetate is effective in vernal keratoconjunctivitis for complete disappearance of papillae.

Key words: Vernal Keratoconjunctivitis; Supratarsal injection; Triamcinolone Acetate; Papillae.

One of the most frequent and ideal location for allergic reactions is eye in the human body.¹ Vernal Keratoconjunctivitis is a chronic and recurrent inflammation of the conjunctiva and cornea and affects both eyes. Three quarters of VKC patients have atopy and among them two – third have family history. VKC usually starts after the age of 5 years and resolve around puberty but in very small number of patients it persists beyond the age of 25 years.³ It is more common in summer, dry, subtropical climates such as Mediterranean, the middle east, central and west Africa, south Africa and Asian countries such as Japan, Thailand and India.⁴ Boys are usually affected

twice more common than girls. The chief symptoms of this disease include severe itching, photophobia, redness and tenacious discharge. The clinical signs develop in conjunctiva and cornea; And include cobble stone papillae in the upper tarsal conjunctiva, limbal conjunctival thickening with gelatinous nodule and tranta's dots in the conjunctiva and superficial punctate keratopathy, shield ulcer and vascularization known as pannus formation in the cornea.⁵

The etiology of VKC is not simply a type 1 hypersensitivity reaction.⁶ Previous studies have

shown that T helper type 2 cells and their cytokines, corneal fibroblasts and epithelium along with various growth factors plays an important role in the pathogenesis of VKC,⁷ however the immunoglobulin E (IgE) - mediated mechanism does not explain the severity and the clinical course of vernal (VKC) which are probably also related to T cell - mediated responses, massive eosinophils attraction and activation of non-specific hypersensitivity. Recent studies suggest that a wide range of cytokines, chemokines, proteases and growth factors are involved by complex interactions rather than distinct and parallel pathways. There is also a role of several non-specific enzymatic systems activated during acute and chronic allergic inflammation, thus contributing to the complex pathogenesis of the disease.⁸

Treatment options in VKC include mast cell stabilizers, antihistamines, corticosteroids, and immunosuppressive drugs. Cyclosporine has also been shown to be effective in the treatment of VKC but further randomized control trials are required to establish the minimum effective concentration⁹. Keeping in view the above pathogenesis of VKC, new and more specific treatment strategies such as antichemokine receptor antibodies, leukotriene receptor antagonists, and specific macromolecules are under evaluation.^{10,11}

In refractory VKC a number of new therapeutic agents have been tried which include topical non-steroidal anti-inflammatory agents (Suprofen), topical mast cell stabilizers (Nedocromil, Lodoxamide), topical immunomodulators (Cyclosporine), topical antihistamines (Levocabastine), and ganglioside derivatives (Miprogoside). Most of these treatment strategies have been found relatively less effective. High doses of steroids given systemically relieve some signs and symptoms, but tarsal cobblestone papillae and shield ulcers remain relatively unaffected. One of the effective corticosteroid used in VKC is Triamcinolone which is given in the form of injection in the Supratarsal area.¹² It has good therapeutic results in VKC patients according to the study conducted by Sahu N, et al,⁵ most of the patients experienced dramatic symptomatic relief from the disease. Another study conducted by Sadiq MN, et al, showed 50% reduction of symptoms¹². Triamcinolone acetonide has been effectively used in ocular therapeutics for over 50 years. Recently its use has increased for periocular and intraocular treatment of allergic disorders of eye.¹³ According to Burney et al, cobble stone papillae were completely disappeared in

14 out of 18 patients.¹⁴

VKC patients have to use topical medication for a longer period of time and many times a day so poor compliance and cost are the two main problems often experienced by VKC patients. Therefore, this study was designed to determine the effectiveness of supratarsal injection of triamcinolone acetate (Kanakot) in VKC patients. This study was also aimed to provide us local statistics regarding the effectiveness of triamcinolone in VKC as no such study has been conducted locally. The objective of the study was to determine the efficacy of supra tarsal injection of triamcinolone acetate among patients with vernal keratoconjunctivitis.

MATERIAL AND METHODS

It was a descriptive case series. This study was carried out at Department of Ophthalmology, Lady Reading Hospital Peshawar. The duration of the study was 6 months from 6th February to 6th July, 2012.

It was non probability (consecutive) sampling. The sample size was calculated to be 196, using 50%¹² efficacy of triamcinolone injection in the treatment of VKC, 95% confidence level and 7% margin of error according to WHO software for sample size determination. All those patients presented to our OPD with VKC, patients of either gender and Patients of age greater than 6 years were included in the study. Patients who were having Intra ocular pressure more than 21 mm of Hg by Goldman appplanation tonometer, patients who were having active bacterial infection with mucopurulent discharge and patients who were receiving steroids for other eye diseases like uvetis, scleritis were excluded from the study.

All patients fulfilling the inclusion criteria were included in the study through the OPD. The diagnosis of VKC was based upon history of itching, photophobia and slit lamp examination showed papillae over palpebral conjunctiva.

The purpose and benefits of the study was explained to the patients / attendants and a written informed consent was obtained. All patients were worked up with complete history, clinical examination including detailed ophthalmological examination followed by routine investigation to rule out confounder and bias in study result.

The entire patients were subjected to injection triamcinolone acetate by an expert ophthalmologist in the dose of 0.5 ml (20 mg) of triamcinolone acetonide

in potential space between conjunctiva and muller muscle. The patients were followed-up for two weeks after the injection for relief of itching and photophobia and disappearance of papillae to determine the efficacy of the drug and all the above mentioned information including age, gender, address were recorded in a predesigned proforma. The potential complications like blephropotosis, skin depigmentation, infections, motility disturbances, conjunctival scarring and increase in intraocular pressure were also observed in the patients in follow-up.

All the data was analyzed in SPSS version 10. Frequency and percentages were calculated for categorical variables like gender and drug efficacy. Mean \pm SD were calculated for continuous variables like age and duration of symptoms. Drug efficacy was stratified among the age, gender and duration of symptoms to see the effect modifiers. All the results were presented as tables and graphs.

RESULTS

The total number of patients presenting with vernal keratoconjunctivitis was 196 comprising of 130 (66.33%) males and 66 (33.67%) females (Fig. 1).

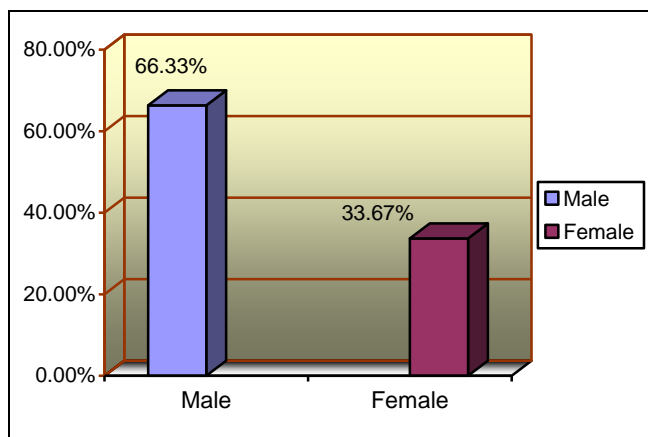


Fig. 1: Gender distribution of patients with vernal keratoconjunctivitis treated with supra tarsal injection of triamcinolone

n = number of observed patients, % = Percentage

Maximum number of patients presenting with vernal keratoconjunctivitis was 130 (66.33%) from the age group of 11 to 20 years followed by 34 (17.35%) and 26 (13.26%) patients from the age groups of 6 to 10 and 21 to 30 years respectively. Minimum number of

patients were 6 (3.06%) from the age group of 31 to 40 years (Table 1).

The mean age of male and female patients with vernal keratoconjunctivitis was 14.69 years \pm 5.50 SD and 16.31 years \pm 6.23 SD respectively with an overall mean age of 15.23 \pm 5.79SD (Table 2).

Table 1: Age distribution of patients with vernal keratoconjunctivitis treated with supra tarsal injection of triamcinolone.

Age (Years)	Frequency n (%)
6 - 10 years	34 (20.00)
11 - 20 years	130 (76.47)
21 - 30 years	26 (15.29)
31 - 40 years	6 (5.53)
Total	196 (100)

Table 2: Mean \pm standard deviation of age of patients with vernal keratoconjunctivitis treated with supra tarsal injection of triamcinolone.

Gender	Mean \pm Standard Deviation
Male	14.69 \pm 5.50
Female	16.31 \pm 6.23
Total	15.23 \pm 5.79

Table 3: Distribution of patients according to duration of symptoms with vernal keratoconjunctivitis treated with supra tarsal injection of triamcinolone.

Duration of Symptoms	Frequency n (%)
Less than 30 days	98 (50.00)
30 to 90 days	62 (31.63)
More than 90 days	136 (18.37)
Total	196 (100)

N = number of observed patients, % = Percentage

According to duration of symptoms, maximum number of patients with vernal keratoconjunctivitis

treated with supra tarsal injection of triamcinolone were those having symptoms of less than 30 days and were 98 (50.00%). Minimum number of patients were 36 (18.37%) who were having symptoms of vernal keratoconjunctivitis for more than 90 days. Full detail is shown in table 3.

For patients with duration of symptoms less than 30 days, mean \pm standard deviation was 25.95days \pm 2.45 SD, for 30 to 90 days, it was 58.17 days \pm 18.365 SD and for patients having symptoms more than 90 days, mean \pm standard deviation was 108.75 days \pm 21.87 SD. The overall mean duration of symptoms was 51.35 \pm 33.78 SD (Table 4).

Table 4: Mean \pm standard deviation of duration of symptoms of patients with vernal keratoconjunctivitis treated with supra tarsal injection of triamcinolone.

Duration of Symptoms	Frequency n (%)
Less than 30 days	98 (50.00)
30 to 90 days	62 (31.63)
More than 90 days	36 (18.37)
Total	196 (100)

Table 5: Effectiveness of supratarasal triamcinolone injection according to duration of symptoms in patients with vernal keratoconjunctivitis in terms of complete disappearance of papillae at 2 weeks follow-up (N = 170).

Duration of Symptoms	Effectiveness n (%)
Less than 30 days	90 (52.94)
30 to 90 days	50 (29.41)
More than 90 days	30 (17.65)

According to age wise stratification of supratarasal triamcinolone injection effectiveness in patients with vernal keratoconjunctivitis in terms of complete disappearance of papillae at 2 weeks follow up, effectiveness was most in the age group of 11 to 20 years, which was noted in 120 (70.59%) patients. Minimum effectiveness was observed in the age group of 31 to 40 years in which only 2 (1.18%) patients

showed effectiveness to supratarasal triamcinolone injection (Fig. 4).

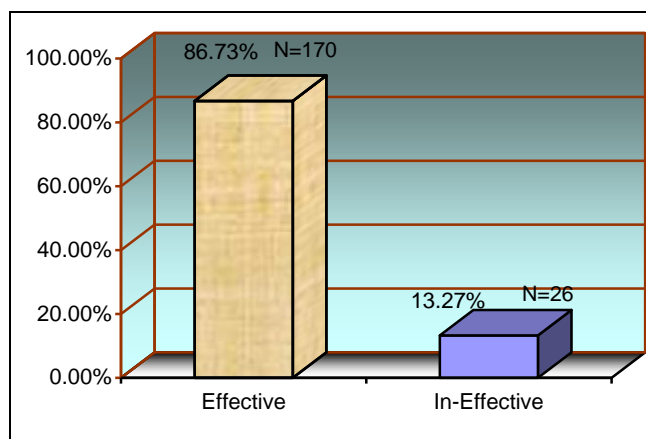


Fig. 2: Effectiveness of supratarasal triamcinolone injection in patients with vernal keratoconjunctivitis in terms of complete disappearance of papillae at 2 weeks follow-up. n= number of observed patients, % = Percentage

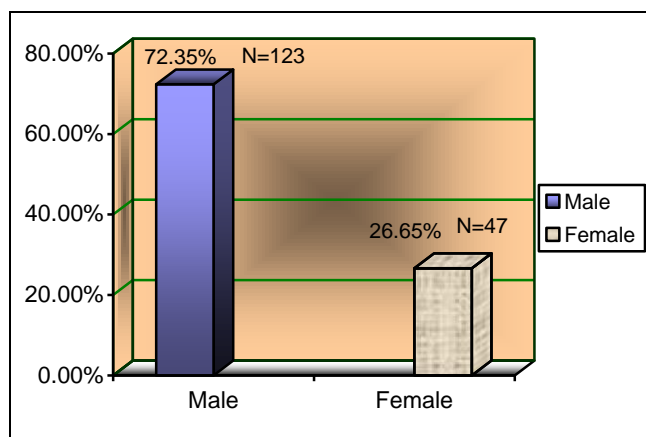


Fig. 3: Effectiveness of supratarasal triamcinolone injection according to gender in patients with vernal keratoconjunctivitis in terms of complete disappearance of papillae at 2 weeks follow-up (N = 170) N = Total number of patients, n = number of observed patients, % = Percentage

The supratarasal triamcinolone injection was effective in 170 (86.73%) patients with vernal keratoconjunctivitis in terms of complete disappearance of papillae at 2 weeks follow up while

26 (13.27%) patients showed no response (Fig. 2). And those patients in which it was effective were followed for further three months for recurrence of the papillae but no recurrence noted in any of the patients. Also the intraocular pressure measurement was taken at two weeks and three months follow up to note IOP of above 21 mm Hg in any patients but in none of the patients IOP of above 21 mm Hg noted.

According to gender wise distribution of effectiveness to supratarsal triamcinolone injection for vernal keratoconjunctivitis, 123 (61.18%) males and 47 (27.65%) females showed response in terms of complete disappearance of papillae at 2 weeks follow up (Fig. 3).

According to duration of symptoms of vernal keratoconjunctivitis, supratarsal triamcinolone injection was most effective in patients having symptoms less than 30 days and this was observed in 90 (52.94%) patients. Patients having duration of symptoms of 30 to 90 days and those having for more than 90 days showed effectiveness in 50 (29.65%) and 30 (17.65%) patients respectively (Table 5).

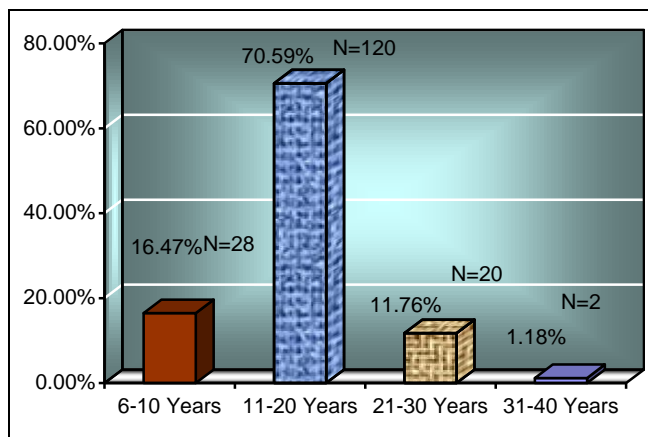


Fig. 4: Effectiveness of supratarsal triamcinolone injection according to age in patients with vernal keratoconjunctivitis in terms of complete disappearance of papillae at 2 weeks follow up (N = 170).

DISCUSSION

Almost 33% of the population of world is affected by some form of allergic disease¹⁵ of whom ocular allergic symptoms are estimated to be present in 40%–80%¹⁶ and this prevalence is even greater in Western countries than in Asia or Africa.¹⁷

Allergic vernal keratoconjunctivitis (VKC) which affects children and young adults is a chronic and recurrent inflammatory disease of conjunctiva¹⁸. Of all ophthalmology visits in outpatient clinics about 1–2.5% have vernal keratoconjunctivitis.¹⁹ VKC is more common in teenagers, especially boys. In majority of patients it presents with mild symptoms and does not draw much attention of either patient or the doctor. While in severe cases the symptoms are very disturbing to the patient as well as treatment of severe VKC is a challenge for the ophthalmologist and these patients develop disease related and / or iatrogenic complications. Many treatment strategies are currently available for VKC. 20 Patients need an effective treatment due to debilitating symptoms and signs of VKC. Medical treatments with current topical medications such as artificial tears, topical antihistamines, mast cell stabilizers, NSAID, or topical steroids are not fully effective. Topical cyclosporine was used recently, but after cessation of treatment, symptoms and signs recurred.²¹ In 1996 Holsclaw²² reported his initial experience of managing twelve such patients with supratarsal injection of either short or intermediate acting corticosteroids. Dramatic symptomatic and clinical response was noted in all patients irrespective of the type of corticosteroid used. However persistent increase in intra ocular pressure was also observed in one patient in their series after injection of intermediate acting corticosteroid.

The initial symptomatic relief is provided by Supratarsal injection of corticosteroids because it decreases inflammation locally. The depot steroid injections in the lesion do not raise significant blood cortisol levels, avoiding systemic anti-inflammatory activity and remission of inflammation at another site in the body.²³

In our study, the supratarsal triamcinolone injection was effective in 86.73% patients with vernal keratoconjunctivitis in terms of complete disappearance of papillae at 2 weeks follow up while 13.27% patients showed no response. In our study the clinical resolution of cobblestone papillae was universal. It also resulted in the resolution of limbal edema and shield ulcer despite their closeness to the site of injection in all patients. Each patient achieved impressive symptomatic improvement and marked decrease in cobblestone papillae. Furthermore in 86.73% patients complete disappearance of cobblestone papillae occurred after supratarsal injection.

According to Aghadost D et al²⁰ triamcinolone

acetamide injection in supratarsal area relieved signs and symptoms in 100% of patients and there was no recurrence of VKC in 87.5% of cases ($p < 0.05$). Douglas et al²⁴ in 1995 showed that they had no recurrence of VKC after short or intermediate acting steroids injection in supratarsal areas. This difference may be due to quality of medication and Immunologic status of patients.

In 2010 study conducted by Qamar MR et al² 440 patients were treated, out of which 81.82% were males. Mean age was 16 years (Range: 2 - 42 years). Mean duration of disease was 18 weeks (Range: 4 weeks to 6 months). Patients were followed up and multiple injections were given to control the disease. The most common side effect injection therapy was transient redness. Study showed 100% effectiveness of supratarsal injection of Triamcinolone acetamide.

In a study by Sadiq MN et al,¹² in first few days of injection a dramatic relief of symptoms (burning, itching, lacrimation and photophobia, ropy discharge) was observed in all patients. The decrease in size of the cobble stone papillary hypertrophy in tarsal conjunctiva and gelatinous thickening of conjunctiva at limbus was significant in the first month but never disappeared completely. No complication was noticed and all patients tolerated the treatment well.

In our study, the mean age of male and female patients with vernal keratoconjunctivitis was 14.69 years \pm 5.50SD and 16.31 years \pm 6.23SD respectively with an overall mean age of 15.23 \pm 5.79SD. The male to female ratio was 1.96:1. The mean age of patients reported by Aghadost D et al,²⁰ was 12.8 \pm 3.9 years (range, 8 - 23) with male to female ratio of 2:1. In other studies the mean was 12 years.¹⁹ In other reports, males were more affected than females, with 3:1 frequency.^{24,25}

In our study, maximum number of patients (66.33%) presenting with vernal keratoconjunctivitis were from the age group of 11 to 20 years and it was due to the fact that VKC affects the younger age group. Our this observation is in accordance to Kumar S and Hall A.^{4,26}

We noticed in our study that the effectiveness was maximally in those who were having symptoms of VKC for less duration. The reason for this might be the fact that this disease is usually seasonal, and such patients respond more to supra tarsal injection of triamcinolone. This has also been noted by Pucci N, et al²⁷ and Leonardi A.²⁸

We did not note any complication and there was no rise in intraocular pressure after steroid injection at two weeks follow-up and three months follow up. This was also noted by Aghadost D, et al,²⁰ and even they did not note any rise in intraocular pressure after 54 months of follow-up.

CONCLUSION

From the results of our study it has been concluded that that supratarsal injection of triamcinolone is effective in vernal keratoconjunctivitis for complete disappearance of papillae after two weeks of Injection and there is no recurrence of the papillae for three months. As there is no intraocular pressure rise and any other complications noted so can be given to patients with poor compliance or poor response to other topical medication.

Author's Affiliation

Dr. Sher Akbar Khan
Vitreoretinal trainee
Department of Ophthalmology
Lady Reading Hospital, Peshawar

Dr. Tajbar Khan
Junior Registrar Saidu Group of Teaching Hospital,
ophthalmology department swat.

Dr. Mubashir Rahman
Vitreoretinal trainee
Department of Ophthalmology
Lady Reading Hospital Peshawar

Dr. Mir Ali Shah
Associate Professor, Department of Ophthalmology,
Lady Reading Hospital Peshawar

REFERENCES

1. **Benitez-del-Castillo JM.** How to promote and preserve eyelid health. *Clinical Ophthalmology* (Auckland, N.Z.) 2012; 61689-98.
2. **Qamar MR, Latif E, Arain TM, Ullah E.** Supratarsal injection of triamcinolone for vernal keratoconjunctivitis. *Pak J Ophthalmol.* 2010; 26: 28-31.
3. **Shafiq I, Shaikh ZA.** Clinical presentation of vernal keratoconjunctivitis: a hospital based study. *JLUMHS* 2009; 08: 50-4.
4. **Kumar S.** Vernal keratoconjunctivitis: a major review. *Acta Ophthalmol.* 2009; 87: 133-47.
5. **Sahu S, Panda S, Parida D, Subdhi BNR, Mohaptra RC.** Role of depot steroids in refractory vernal keratoconjunctivitis. *Orissa J Ophthalmol.* 2009; 81: 3.

6. **Corthay A.** How do regulatory T cells work? *Scand J Immunol* 2009; 70: 326-36.
7. **Irani AM.** Ocular mast cells and mediators. *Immunol Allergy Clin North Am.* 2008; 28: 25-42.
8. **Kari O, Saari KM.** Treatment of eye allergies. *Duodecim* 2012; 128: 291-7.
9. **Kari O, Saari KM.** Updates in the treatment of ocular allergies. *J Asthma Allergy.* 2010; 3: 149-58.
10. **Messmer EM.** Therapeutic options in vernal keratoconjunctivitis. *Ophthalmology* 2009; 106: 557-61.
11. **Kari O, Saari KM.** Diagnostics and new developments in the treatment of ocular allergies. *Curr Allergy Asthma Rep* 2012; 12: 232-9.
12. **Sadiq MN, Bhatia J, Rahman N, Varghese M.** Safety and efficacy of supra tarsal injection of triamcinolone in the management of refractory vernal keratoconjunctivitis. *RMJ.* 2008; 33: 235-8.
13. **Jermak CM, Dellacroce JT, Heffez J, Peyman GA.** Triamcinolone acetonide in ocular therapeutics. *Surv Ophthalmol.* 2007; 52: 503-22.
14. **Burney JA, Ali SS, Baig MSA.** Efficacy of supratarsal injection of triamcinolone acetonide (corticosteroid) for treating severe vernal keratoconjunctivitis (VKC) refractory to all conventional therapy. *Pak J Ophthalmol.* 2010; 26: 201-4.
15. **Key B.** Allergy and allergic diseases. *N Engl J Med.* 2001; 344: 30-7.
16. **Ono SJ, Abelson MB.** Allergic conjunctivitis update on pathophysiology and prospects for future treatment. *J Allergy Clin Immunol.* 2005; 115: 118-22.
17. **Hussain A, Awan H, Khan MD.** Prevalence of non-vision impairing conditions in a village in Chakwal district, Punjab, Pakistan. *Ophthalmic Epidemiol.* 2004; 11: 413-26.
18. **Javadi M.** Focal points in treatment of vernal keratoconjunctivitis. *Bina J Ophthalmology* (Supplement) 1996; 4: 14-5.
19. **Bagheri A, Khaksar M.** Epidemiology of vernal keratoconjunctivitis in Kashan. *Feiz* 1996; 2: 34-52.
20. **Aghadoost D, Zare M.** Supratarsal injection of triamcinolone acetonide in the treatment of refractory vernal keratoconjunctivitis. *Arch of Iranian Med.* 2004; 7: 41-3.
21. **Mantelli F, Santos MS, Petitti T, Sgrulletta R, Cortes M, Lambiase A.** Systematic review and meta-analysis of randomised clinical trials on topical treatments for vernal keratoconjunctivitis. *Br J Ophthalmol.* 2007; 91: 1656-61.
22. **Holsclaw DS, Witcher JP, Wong IG, Morgolis TP.** Supratarsal injection of corticosteroid in the treatment of refractory vernal keratoconjunctivitis. *Am J Ophthalmol.* 1996; 121: 243-9.
23. **Bielory L, Katelaris CH, Lightman S, Naclerio RM.** Treating the ocular component of allergic rhinoconjunctivitis and related eye disorders. *Med Gen Med.* 2007; 15: 35.
24. **Douglas H, Whitcher JP, Wong IG, Margolis TP.** Supratarsal injection of corticosteroid in treatment of refractory vernal keratoconjunctivitis. *Am J Ophthalmol.* 1996; 121: 243-9.
25. **Choi SH, Bielory L.** Late-phase reaction in ocular allergy. *Curr Opin Allergy Clin Immunol.* 2008; 8: 438-44.
26. **Hall A, Shilio B.** Vernal keratoconjunctivitis. *Community Eye Health J.* 2005; 18: 76-8.
27. **Pucci N, Novembre E, Lombardi E, Cianferoni A, Bernardini R, Massai C, et al.** Atopy and serum eosinophil cationic protein in 110 white children with vernal keratoconjunctivitis: differences between tarsal and limbal forms. *Clin Exp Allergy.* 2003; 33: 325-30.
28. **Leonardi A.** Vernal keratoconjunctivitis: pathogenesis and treatment. *Prog Ret Eye Res.* 2002; 21: 319-39.