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Original Research Article

A Study on the Supratarsal Injection of Corticosteroids in the Treatment of Refractory Vernal Keratoconjuctivitis.

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Conflict of interest: Nil

Abstract

Objectives: This present study was to evaluate the effectiveness of supratarsal injection of corticosteroids for the treatment of refractory vernal keratoconjuctivitis in children and young age group population.

Methods: All the patients were randomly selected into three groups (group A, B & C). Each group had 16 patients. **Group A:** Patient eyes were received supratarsal injection of 2 mg dexamethasone. **Group B**: Patients eyes were received supratarsal injection of 10.5 mg triamcinolone. **Group C:** Patient eyes were received supratarsal injection of 50 mg hydrocortisone.

Results: A total of 48 patients (96 eyes) with age group 5 to 25 years were enrolled in this study. Among them, 41(85.41%) were males and 7(14.58%) were females. Mean age of patients had 13.43±2.37 years. Majorities of patients 32(66.67%) were in age group of 11-15 years. clinical history of majorities of patients had seasonal variations 40(83.33%) followed by 30(62.5%) other systemic atopic features, 24(50%) palpebral, 18(37.5%%) family history of disorder, 16(33.33%) mixed, 8(16.67%) shield corneal ulcer and 7(14.58%) bulbar form of disease. There was significant ($p<0.01$) resolution of sign and symptoms seen in all three group of patients within three days of the supratarsal corticosteroid injection.

Conclusions: Preponderance of refractory vernal keratoconjuctivitis is more in children and young population. And supratarsal injection of corticosteroids is the safe and effective mode for the initial and quick management of inflammation of refractory vernal keratoconjuctivitis.

Keywords: Refractory vernal keratconjuctivitis, age group, corticosteroids

Introduction

VKC has wide geographical distribution, it is common in the tropics, including Mediterranean area, Balkans, North and South Africa, and the Indian subcontinent. Some patients develop severe recalcitrant disease which is unresponsive to standard treatment. These patients develop disease-related and/or iatrogenic complications with irreparable ocular morbidity and even blindness [1].

Vernal, derived from the Greek meaning occurring in the spring, is a rare, serious form of ocular allergy. The disease characteristics include a predilection for warm rather than cold climates, a frequent family and personal history of atopic

disease, a higher than 2:1 frequency in males over females, and an early onset with 80% of patients below 14 years of age, [2] with remission in late teens. Refractory vernal keratoconjuctivitis is Characterised by ptosis, ropy mucous discharge, photophobia, large, non-uniform cobblestone papillae, Horner–Trantas dots, limbal nodules, neovascularisation, corneal shield ulcers, and itching. The common and often debilitating symptoms of VKC are itching, photophobia, and pain [3]. Patients who take anti-allergic medications systemically or nasally need to be asked specifically about eye symptoms, since it is estimated that 90% of patients with allergic rhinitis have ocular symptoms as well [4].

Many patients with advanced VKC remain markedly symptomatic and debilitated despite the most aggressive medical management including topical antihistamines, tear substitutes, NSAIDs, mast cell stabilizers and corticosteroids [5,6]. Pattern of VKC in the Indian subcontinent is essentially similar to pattern in other tropical countries which is predominantly a mixed form of disease (72%) with a significant no. of patients having a chronic perennial form (36%) and lesser association with atopy or systemic allergies as compared to patients in temperate zones [7]. Objectives of our study was to evaluate the effectiveness of supratarsal injection of corticosteroids for the treatment of refractory vernal keratoconjuctivitis in children and young age group patients.

Material & Methods

This study was conducted in Department of Ophthalmology, Sri Krishna Medical College & Hospital, Muzaffarpur, Bihar, India during a period from March 2021 to November 2021. Entire subjects signed an informed consent approved by institutional ethical committee of SKMCH was sought.

A total of 48 patients (96 eyes) with age group 5 to 25 years of refractory vernal kerotoconjuctivitis were enrolled in this study.

Inclusion criteria: The patients who not responding to month long maximum topical therapy were included in this study.

Exclusion criteria: The eyes with active ocular infection and those patients who were concurrently treated for other allergic disorders were excluded from the study.

All the patients were randomly selected into three groups (group A, B & C). Each group had 16 patients.

Group A: Patient eyes received supratarsal injection of 2 mg dexamethasone. **Group B:** Patients eyes received supratarsal injection of 10.5 mg triamcinolone. **Group C:** Patient eyes received supratarsal injection of 50 mg hydrocortisone.

Corticosteroids given were in equivalent anti-inflammatory doses. All patients had a wash off period of two weeks prior to the administration of study drugs. In this period all topical medications were discontinued, and patients were maintained on frequent cold compresses and disodium cromoglycate 2% eye drops four times daily. The symptoms (itching, tearing, photophobia and redness) and the signs (lid oedema, tarsal papillae, conjunctival chemosis, conjunctival discharge, Tranta's dots and keratopathy) were subjectively graded by the patient and the treating physician respectively. The grading was done at entry into the study, and at all subsequent follow-up visits. The score for all these symptoms and signs was added to get the score at time of entry into the study and subsequently at each follow-up visit. Both eyes of a patient were injected with the same corticosteroids and were treated 3 weeks apart. After the supratarsal injection patients were advised frequent cold compresses and topical disodium cromoglycate 2% four times daily. The treating physician (who injected the drug) and the evaluating physician grading the symptoms and signs were masked during

the study period. Each eye was evaluated at the third day, every week thereafter up to four weeks and then every month up to 6 months. All patients were observed for any side effects of corticosteroid injection such as ptosis, depigmentation of eyelid skin, infections, motility disturbances, conjunctival scarring and raised intraocular pressure (IOP). Recurrence of disease was graded and scored. Moderate to severe disease was considered to be an indication for repeat supratarsal injection of corticosteroid.

Injection technique:

An anaesthesia was used to allow the injection to be easily tolerated. First, a drop of 4% xylocaine was instilled into the eye. A cotton-tipped applicator soaked in 2% xylocaine was held on the upper tarsal border of superior tarsus of the everted eyelid for approximately one minute. A 26G needle was used to inject 0.25ml of 2% xylocaine with epinephrine (1:200,000) while the superior tarsus was lifted away with a lid hook. The needle was placed sub-conjunctivally approximately 1mm above the superior tarsal border to avoid the marginal arcade blood vessels. This produced ballooning of the potential space between the conjunctiva and Muller's muscle. After 2 minutes, the time for the anaesthetic to take effect, a 26G, 5/8 inch needle was positioned in the supratarsal subconjunctival space and the intended corticosteroid was injected.

Statistical Analysis

Data was analysed with the help of SPSS software. T-test was applied. P-value was taken less than or equal to 0.05 ($p \leq 0.05$) for significant differences.

Observation

A total of 48 patients with age group 5 to 25 years were enrolled in this study. Among them, 41(85.41%) were males and 7(14.58%) were females. Mean age of patients had 13.43±2.37 years. Majorities of patients 32(66.67%) were in age group of 11-15 years. Both eyes (96 eyes) were affected with vernal keratoconjuctivitis. Mean age of onset of disease was 9.42 years.

Table 1: Age wise distribution of patients of vernal keratoconjuctivitis.

Age group (Years)	No. of patients	Percentage of patients
5-10	11	22.92%
11-15	32	66.67%
16-20	4	8.33%
21-25	1	2.08%
Total	48	100%

Table 2: Clinical history of refractory vernal conjunctivitis.

Clinical history	No. of patients	Percentage
Family history of allergic disorder	18	37.5%
Palpebral	24	50%
Other systemic atopic features (asthma, hay fever, eczema)	30	62.5%
Mixed	16	33.33%
Bulbar	7	14.58%
Shield corneal ulcer	8	16.67%
Seasonal variation	40	83.33%

In this present study, clinical history of majorities of patients had seasonal variations 40(83.33%) followed by 30(62.5%) other systemic atopic features,

24(50%) palpebral, 18(37.5%%) family history of disorder, 16(33.33%) mixed, 8(16.67%) shield corneal ulcer and 7(14.58%) bulbar form of disease.

There was significant ($p<0.01$) resolution of sign and symptoms seen in all three group of patients within three days of the supratarsal corticosteroid injection. This response was independent of the severity or duration of disease. Itching was first to disappear and the photophobia was the last to disappear in all three groups patients.

Mild symptoms recurred at 12 weeks' follow-up in all three groups. Photophobia was least in severity among the symptoms that recurred during follow-up.

Improvement in signs was seen by 2 weeks. The lid oedema nearly disappeared in 2 weeks and the size of cobblestone papillae reduced by 54% at 2 weeks' follow up in all the three groups. There was reduction in conjunctival chemosis, discharge and Tranta's dots.

The corneal shield ulcers healed completely by 3 weeks in all eyes in three groups. Clinical signs recurred in all the three groups. Lid oedema and conjunctival chemosis were the first to reappear. Cobblestone papillae started increasing in size at 12 weeks' follow-up. All eyes developed moderate to severe papillae at the 5 months' follow-up visit. The conjunctival discharge recurred in all the three groups and no eye was completely free of discharge at the 4 months' follow-up visit. But there was no recurrence of corneal shield ulcer in any eye in any group. The recurrence was independent of the type of corticosteroid used.

Thus, after initial rapid clinical improvement, clinical symptoms and signs recurred in all the three groups starting at 12 weeks' follow-up and the severity of recurrence of disease gradually increased enough by 5 months to require repeat injection. There were no statistically ($p>0.05$) significant differences seen in the initially rapid improvement and recurrence rate among all the three groups. No complication was seen in any eye in all the three group patients.

Discussions

Vernal keratoconjunctivitis (VKC) is a severe perennial or seasonal form of allergic conjunctivitis predominantly affecting children and young adults (Neumann et al. 1959) [8]. Chief symptoms of this disease include severe itching, photophobia, redness and tenacious discharge (Jones 1961) [3]. Involvement of upper tarsal conjunctiva with cobblestone papilla and limbal conjunctival thickening with gelatinous nodules are important diagnostic signs. Corneal involvement can occur in the form of punctate keratitis, shield ulcer, scarring and pannus (Buckley 1981) [9]. Often VKC is associated with atopy manifesting as atopic eczema, hay fever and food allergy (Morgan 1971) [10].

In our present study, the mean age of patients was 13.43±2.37 years (Range 5–20 years); in other studies, the mean was 12 years [11].

In our present study, after administration of corticosteroid injection we noticed a significant symptomatic improvement in all patients within 1-3 days of receiving supratarsal injection of each of the three corticosteroids: hydrocortisone, dexamethasone and triamcinolone. The response was independent of the severity of disease and was found to be statistically significant. A reduction of 54% or more in size of cobblestone papillae was noticed after 2 weeks in all patients and was independent of the type of corticosteroid used. But mild recurrence of symptoms was noticed after 12 weeks and after 5 months moderate to severe symptoms and signs reappeared in all patients in the three groups. Thus, at five months' follow-up most patients had developed crippling disease requiring a repeat injection. There was no statistically significant difference in the recurrence of symptoms and signs in

the three corticosteroid treated groups. Significantly, none of the eyes showed recurrence of corneal shield ulcers by 6 months. Also no patient in either group developed any side effects of the therapy, including increased IOP.

Holsclaw et al. in 1996 [12] have reported their initial experience of managing twelve such patients with supratarsal injection of either short or intermediate acting corticosteroids. All patients in their series showed a dramatic symptomatic and clinical improvement irrespective of the type of corticosteroid used. One patient in their series developed persistent increase of intraocular pressure after injection of intermediate-acting corticosteroid. However, this study did not employ a case control protocol.

In our study, we also found a dramatic response in all patients within 1–3 days of receiving supratarsal injection. The response was independent of the severity of presenting symptoms and was found to be statistically significant($p<0.05$). Supratarsal injection of corticosteroids provides initial symptomatic relief by reducing the inflammation locally. Intralesional depot steroid injections do not raise significant blood cortisol levels to exert systemic anti-inflammatory activity or cause remission of inflammation at another site in the body [13,14].

In our study, the initial response to treatment was consistent with reports of Holsclaw et al [12] and Saini et al. [14] They also observed maximal reduction in size of papillae in 2 weeks and healing of shield ulcers in 3 weeks. But in our study the symptoms and signs recurred during the follow-up period in all patients. Holsclaw et al [12] and Saini et al [14] have reported mild to moderate recurrence in 16% and 23% of patients respectively. This could be because of climatic variations in habitat of patients.

Satvir Singh studied the effectiveness and side effects of supratarsal injection of steroids and labelled it as safe therapy [15] 5. Recent studies have also shown that Triamcinolone is equally effective than any other corticosteroid given as supratarsal injection [16,17].

Conclusions

This present study concluded that the preponderance of refractory vernal keratoconjuctivitis is more in children and young population. And supratarsal injection of corticosteroids is the safe and effective mode for the initial and quick management of inflammation of refractory vernal keratoconjuctivitis.

References

1. Buckley RJ. Vernal keratoconjunctivitis. Int Ophthalmol Clin 1988; 28:303-8.
2. Allansmith MR, Ross RN. Ocular allergy and mast cell stabilizers. Surv Ophthalmol 1986;30(4):229-44.
3. Jones BR. Vernal keratitis. Trans Ophthalmol Soc UK 1961; 81:215-28.
4. Berger W, Abelson MB, Gomes PJ, et al. Effects of adjuvant therapy with 0.1% olopatadine hydrochloride ophthalmic solution on quality of life in patients with allergic rhinitis using systemic or nasal therapy. Ann Allergy Asthma Immunol 2005;95(4):361-71.
5. Dahan A, Appel R. Vernal keratoconjunctivitis in the black child and its response to therapy. Br J Ophthalmol 1983; 67:638-92.
6. Meyer E, Krans E, Zonis S. Efficacy of anti-prostaglandin therapy in vernal keratoconjunctivitis. Br J Ophthalmol 1987;71:497-99.
7. Gokhale NS. Systematic approach to managing vernal keratoconjunctivitis in clinical practice: severity grading system and treatment algorithm. Indian J Ophthalmol 2016;64(2):145-8.
8. Neumann E, Gutmann MJ & Blumenkrantz N. A review of four hundred cases of vernal keratoconjunctivitis. Am J Ophthalmol 1959; 47: 166–172.

9. Buckley RJ. Vernal keratopathy and its management. Trans Ophthalmol Soc UK 1981; 101: 23 4–238.
10. Morgan S. The pathology of vernal conjunctivitis. Trans Ophthalmol Soc UK 1971; 91: 467–478.
11. Bagheri A, Khaksar M. Epidemiology of vernal keratoconjunctivitis in Kashan [in Persian]. Feiz 1996; 2:34-52.
12. Holsclaw DS, Whitcher JP, Wong IG & Margolis TP: Supratarsal injection of corticosteroid in the treatment of severe vernal keratoconjunctivitis. Am J Ophthalmol 1996; 121: 243–249.
13. Guzzo CA, Lazarus GS, Werh VP. Dermatologic pharmacology. In: Hurdman JG, Limbird LE, Motinoff PB, et al. eds. Goodman and Gilman's pharmacological basis of therapeutics. New York: McGraw Hill 1996; 1597.
14. Saini JS, Gupta A, Pandey SK, et al. Efficacy of supratarsal dexamethasone versus triamcinolone injection in recalcitrant vernal keratoconjuncti-vitis. Acta Ophthalmol Scand 1999; 77 (5):515-8.
15. Singh S, Pal V, Dhull CS. Supratarsal injection of corticosteroids in the treatment of refractory vernal keratoconjunctivitis. Ind J Ophthalmol. 2001; 49: 241-5.
16. Aghadoost D, Zare M. Supratarsal injection of Triamcinolone acetonide in the treatment of refractory vernal keratoconjuncti-vitis. Arch Ira Med. 2004; 7: 41-3.
17. Batool D. R., Jamal D. K., Sheroze D. M. W., Bhatti D. I. A., Jaffar D. N., Haider D. G., & Faridi D. M. A. Clinical features of colorectal carcinoma at the Jinnah Postgraduate Medical Centre, Karachi, Pakistan: a cross-sectional study. Journal of Medical Research and Health Sciences, 2022;5(9): 2203–2209.