

# Autologous Serum In Vernal Keratoconjunctivitis

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## ABSTRACT

**Objective** To find out effectiveness of supratarsal injection of autologous serum in patients suffering from vernal keratoconjunctivitis refractory to topical treatment.

**Study design** Observational study.

**Place & Duration of study** Department of Ophthalmology at Khalid Eye Hospital Karachi, from March 2019 to August 2019.

**Methodology** This study recruited patients of either gender with sign and symptoms of vernal keratoconjunctivitis refractory to previous treatment for at least one year. The parents of all the patients were briefed about the study protocol. Informed consent was taken. Study was approved by the institutional ethical review committee. Autologous serum of each patient was obtained and injected into the supratarsal space of the upper eye lid with 27-gauge needle under topical anesthesia with concurrent continuation of the medical treatment. The follow up period was of one month. Main outcome measure was the resolution of sign and symptoms of about 50% after one week and patient remaining symptom free by the end of one month. The outcome depended upon the clinical judgment of the ophthalmologist and patient's satisfaction level.

**Results** A total of 48 eyes of 25 patients between the ages of eight to sixteen years were included in this study. Mean age was  $12.1 \pm 2.72$  year. By the end of one week, there was reduction of signs and symptoms by fifty percent in 40 (83%) eyes.

**Conclusion** Autologous serum was found to be an effective alternative treatment for vernal keratoconjunctivitis refractory to other medical treatment with no adverse effects.

**Key words** Autologous serum, Supratarsal injection, Vernal keratoconjunctivitis.

## INTRODUCTION:

A bilateral, chronically recurring inflammatory condition of the ocular surface, the vernal keratoconjunctivitis (VKC), most commonly affects children and young adolescents and is more prevalent among boys.<sup>1</sup> Individuals with vernal

keratoconjunctivitis frequently present with ocular itching, redness, watering, photophobia and foreign body sensation. When severe or left untreated, it may result in the formation of diffuse papillae around the limbus and palpebral conjunctiva causing mechanical damage to the cornea which may ensue into potentially sight threatening complications.<sup>2</sup> It is crucial to identify the disease and start prompt treatment in order to limit the vicious inflammatory cycle of the reciprocal contact between cornea and the conjunctiva which may end up in damaging the epithelium and stroma of the cornea with development of infectious keratitis, shield ulcers / plaques, keratoconus, scar and paucity of the limbal stem cells.<sup>3</sup>

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The management of ocular surface disease is quite a challenge for an ophthalmologist anywhere in the world since the basic disturbance of the disease involves the intricate equilibrium between the cornea, tear film and the conjunctiva. The pathogenesis underlying VKC comprises of the characteristic IgE mediated hypersensitivity and Th2 (T helper cell) mediated response together with IgG, basophil hypersensitivity as well as delayed hypersensitivity.<sup>4-6</sup> The present treatment of vernal keratoconjunctivitis is based upon the use of topical steroids, antihistamines, mast cell stabilizers, topical autologous serum, immunosuppressives (cyclosporine), lubricants, bandage contact lens, cryotherapy and surgically removing the papillae.<sup>2</sup> In this study supratarsal autologous serum injection was used in patients suffering from vernal keratoconjunctivitis who were refractory to the other medical treatment.

#### **METHODOLOGY:**

This observational study was carried out in the outpatient department of Ophthalmology at Khalid Eye Hospital, Karachi from March 2019 to August 2019. Thorough ocular assessment was done in all patients along with information about symptoms, family or personal history of allergic disorders, changes in visual acuity and slit lamp biomicroscopy. Inclusion criteria for this study were patients between the ages of 8 to 16 years, with complaint of dryness, foreign body sensation, burning, tearing, itching, redness, tarsal conjunctival and limbal changes and compliance with the follow up visits. Exclusion criteria was history of any ocular trauma or surgery, use of recent eye drops other than for the treatment of VKC, active infection, or inflammatory disease at the ocular surface, lacrimal drainage system abnormality, contact-lens wear, systemic disease affecting the ocular surface and any blood borne disease.

In patients of vernal keratoconjunctivitis refractory to other medical treatment a single supratarsal injection of autologous serum into their tarsal space of the upper eyelids was given with 27-gauge needle along with the continuation of concurrent medical treatment. The patients were called for follow up after one week to assess for the resolution of signs and symptoms as judged by the patients themselves and the ophthalmologist.

The study criteria for documenting treatment effectiveness include resolution of itching, photophobia, redness, discharge and limbal papillae. Grading of itching was done according to the subjective assessment by the patient of whether it

reduced up to 50 percent or resolved completely. For photophobia, if patient could tolerate slit lamp beam of dim illumination for fifteen second it was considered as an improvement of up to 50%. For redness, comparison of the extent of conjunctival redness from pre injection clinical record was made.

A similar criterion was adopted for discharge and resolution of limbal papillae. The follow up period was of one month to observe for the presence of symptom free eyes and parent's satisfaction level. The study approval was obtained by the institution ethical review committee and informed consent was taken from parents.

For preparation of autologous serum ten milliliters of blood was taken from each patient and rested for half an hour to allow the blood constituents to sediment. It was then centrifuged for 10 minutes at 2900 x g. Under sterile environment, extraction of serum was done. Five mL of serum was mixed with five mL of normal saline solution to produce a 50% concentration which was the desired concentration to inject. The autologous serum solution from each patient was injected fresh one time 25 units at two to three different sites into the tarsal space of the upper eyelid of the respective patient and the remaining solution discarded. No antibiotics were added to the autologous serum solution. SPSS version 25 was used to assess the statistical data.

#### **RESULTS:**

A total of 48 eyes of 25 patients between the ages of eight to sixteen years were included in this study. Mean age was  $12.1 \pm 2.72$  years. The study included seventeen (68%) boys and eight (32%) girls with 32 (67%) eye of boys and 16 (33%) of girls. Bilateral involvement was present in 25 (92%) patients. By the end of one week, there was reduction of signs and symptoms by fifty percent in 40 (83%) eyes. One step test was used and the results were highly significant as  $p$ -value  $< 0.001$ . Table I shows the detailed result at the end of one month followup period. Complications such as severe lid edema, infection, granuloma formation or any hypersensitivity reaction were not observed in any patient.

#### **DISCUSSION:**

Vernal keratoconjunctivitis is a long term, seasonally variable, self-limiting allergic ocular disease mainly affecting individuals between the ages of 6 to 20 years old resulting in consequential damage to the cornea and visual acuity, hence influencing the quality of life of school going children necessitating treatment and compliance with frequent follow up visits with an ophthalmologist.<sup>7</sup> VKC

**Table I: Outcome At Follow up**

Symptoms & Signs	Improvement at One week	Improvement at One month	p-value
Itching	50% reduction in 40 eyes	No complain in 45 eyes	<0.001
Photophobia	50% reduction in 43 eyes	No complain in 46 eyes	<0.001
Redness	50% reduction in 39 eyes	Resolved in 43 eyes	<0.001
Discharge	50% reduction in 40 eyes	Disappear in 45 eyes	<0.001
Limbal papillae	50% reduction in 38 eyes	Resolved in 25 eyes	<0.001

comprises of three archetypal forms; palpebral / tarsal, limbal and mixed form. The palpebral type presents with conjunctival hyperemia and papillary hypertrophy whereas the limbal form with glutinous limbal thickening, mucoid nodules and Horner-Trantas dots. Mixed type has features of both palpebral and limbal VKC. Pseudogerontoxon, punctate epithelial keratitis, shield ulcers and ectasia may present on the cornea.<sup>1,8</sup>

VKC is a hypersensitivity response involving the conjunctival and corneal contact with exogenous allergens leading to a disparity between the Th2 and Th1 lymphocytes causing over activation of Th2 cells.<sup>1</sup> In order to alleviate the clinical signs and symptoms of the disease, various new as well as old pharmacological and non pharmacological interventions are available. The treatment of VKC is dependent upon the severity and includes a combination of topical form of many drugs.<sup>9-14</sup> However, none of the pharmacological agents are ideal and come with a set of adverse effects, especially corticosteroids, which are a favored choice, but have a significant drawback of causing rise in the intraocular pressure together with lenticular changes and keratitis.<sup>15</sup>

In this study an alternate adjuvant treatment modality was used. Studies have been conducted assessing the application of autologous serum as a topical agent.<sup>16,17</sup> Ramirez utilized 20% autologous serum as a topical agent for the treatment of vernal keratoconjunctivitis and concluded that it decreased the symptoms in 78.13% of the cases and signs in 66.27% after one month of follow up with no adverse effects.<sup>18</sup> The results of present study were in accordance with other studies. Injecting the autologous serum minimizes the risk of contamination, eliminates the need for storage as well as reduces the chance of development of ocular surface infection/ inflammation or eyelid eczema associated with topical instillation of autologous serum.

#### CONCLUSION:

Autologous serum was found safe and effective adjuvant treatment for vernal keratoconjunctivitis which is refractory to other medical treatment.

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Khalid Mahmood: Data collection, Proof reading  
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