

Management of Seasonal Viral Keratoconjunctivitis with Ganciclovir in a Regional Military Hospital

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Abstract

Introduction: Seasonal keratoconjunctivitis of military personals in Chattogram area causes loss of many working hours with prolonged sufferings.

Objective: To explore the outcome of using Ganciclovir in seasonal viral keratoconjunctivitis in Combined Military Hospital, Chattogram.

Methods: This prospective study was conducted in department of ophthalmology of Combined Military Hospital (CMH), Chattogram, from January 2013 to September 2018. Diagnosis was made by clinical signs, symptoms and laboratory study of conjunctival smear to exclude bacterial or fungal cause. Initially they were treated with artificial tear and antibiotic to prevent secondary bacterial infection. After three days of complete rest, the cases presented with static or further deteriorated condition were treated with Ganciclovir eye gel five times a day for two weeks. After subsidence of acute redness, topical dexamethasone was also applied for 4 times and then 3 times at one week interval. Follow up periods were 3 days, 1 week, 2 weeks, 4 weeks and 3 months subsequently.

Results: A total of 2678 cases were included in our study. About 78% of the patients were male and 22% were female. 95% patients were from age group of young and serving personnel. Ganciclovir was used in 750 (28%) cases. With conventional treatment, recovery of sign symptoms took 3 weeks (SD-3±1 weeks). Recovery was observed within 10 (9±2 day) days in 450 (60%) cases of using Ganciclovir. Short term complications such as pseudomembrane formation were found in 24% cases and corneal ulcer in 1 case. Superficial punctate keratitis (SPK) was found in 22% cases even after 3 months.

Conclusion: Treating viral conjunctivitis without long term vision impairing sequel is a challenging job due to nonspecific presentation. Without specific features of bacterial or fungal conjunctivitis, patients of seasonal keratoconjunctivitis treated with Ganciclovir provide prompt resolution which save working hours of serving personnel.

Key-words: Viral Keratoconjunctivitis, Ganciclovir, Adenoviral conjunctivitis, Military Hospital.

Introduction

Training period is the most crucial time of soldiers' life. Every hour is very important for development of skill, stamina and professionalism. In Chattogram, there are five important training institutes for defense persons. Every year there is a seasonal outbreak of viral keratoconjunctivitis which hamper their training life with loss of working hours. We cannot avoid keratoconjunctivitis but we can take initiatives to reduce the burden.

Seasonal viral keratoconjunctivitis is usually caused by the adenovirus¹. Adenoviral conjunctivitis is considered as the most common cause of red eye in the world². Prevalence is between 15% to 70% of all conjunctivitis worldwide^{1,2}. There are approximately 50 different serotypes and six distinct subgroups^{3,4}. Common forms are Epidemic keratoconjunctivitis (EKC), pharyngoconjunctival fever and nonspecific follicular conjunctivitis^{2,5}. Epidemic keratoconjunctivitis causes corneal sub-epithelial infiltrates which has got adverse effect on visual acuity⁶.

Like all other epidemics, viral keratoconjunctivitis occurs in crowded living conditions and places where close contact of people is a common phenomenon, such as schools and barracks, hospitals or doctor's clinics^{1,7}. Epidemic keratoconjunctivitis is highly contagious and transmission occurs by direct or indirect contact to ocular or respiratory secretions⁸. Patients usually remain asymptomatic after infection during the incubation period and may accidentally spread the virus⁹. Till today there is no definitive medication for treatment of Epidemic keratoconjunctivitis^{4,6,10}.

In the acute phase patients usually develop severe conjunctivitis and lasts for two to four weeks¹¹⁻¹³. The conjunctival inflammation sometimes can become so severe causing pseudomembrane which may result permanent symblepharon formation or punctual

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occlusion^{13,14}. Purpose of the study is to explore the outcomes of using Gancyclovir in seasonal viral keratoconjunctivitis which is clinically diagnosed with corneal involvement without significant itching and discharge in a Combined Military Hospital Chattogram.

Materials and Methods

This prospective study was done in Department of Ophthalmology, CMH, Chattogram from January 2013 to September 2018. Patients presented with unilateral or bilateral redness at outpatient department. They were evaluated with proper history and meticulous clinical evaluation involving best corrected visual acuity, slit lamp evaluation of anterior segment. Diagnosis was made by clinical signs symptoms and laboratory study of conjunctival smear to exclude bacterial or fungal causes.

Inclusion criteria included patients with conjunctival congestion with superficial punctate keratopathy. Exclusion criteria were any recent history of trauma, previous history of uveitis, neovascular glaucoma or any kind of ocular surgery within three months. Patients presented along with severe discharge and intense itching, were also excluded.

After proper explanation and counseling, patients were instructed to maintain proper hygiene and isolation from other members. Initially they were treated with artificial tear and antibiotic to prevent secondary bacterial infection. After three days of complete rest, the cases presented with static or further deteriorated condition were treated with Gancyclovir eye gel five times a day for two weeks. After subsidence of acute redness, topical dexamethasone was also applied for 4 times daily for a week and then 3 times daily for another week at one week interval. Follow up periods were 3 days, 1 week, 2 weeks, 4 weeks and 3 months. Patients were also counseled to report instantly in case of any development of severe blurring of vision, intolerable pain or any unusual symptoms like significant photophobia.

Results

Out of 2678 cases 78% (2089) were male and 22% (589) were female (Figure-1). Majority (85%) patients were from young age group (Figure-2). With conventional treatment, recovery of sign symptoms took 3 weeks. After 3 days of complete bed rest, when they were re-evaluated, worse cases (28%) were treated with Gancyclovir. Recovery was observed within 10 days in 60% cases of using Gancyclovir (Figure-4). Short term complications as pseudomembrane formation was found in 24% cases (Figure-3) and corneal ulcer developed in 1 case. SPK persisted in 22% cases even after 3 months though inactive and visually insignificant. Steroid was used in 88% cases.

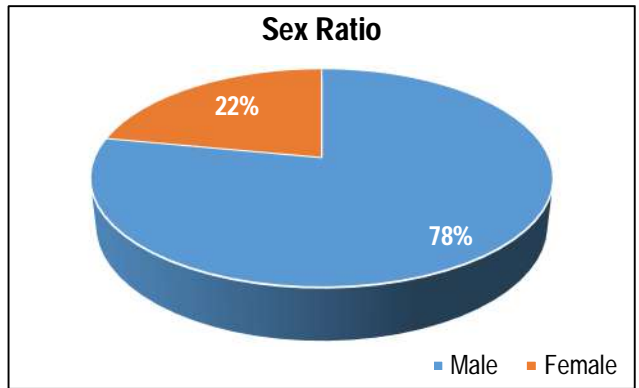


Figure-1: Sex ratio of patients (n=2678)

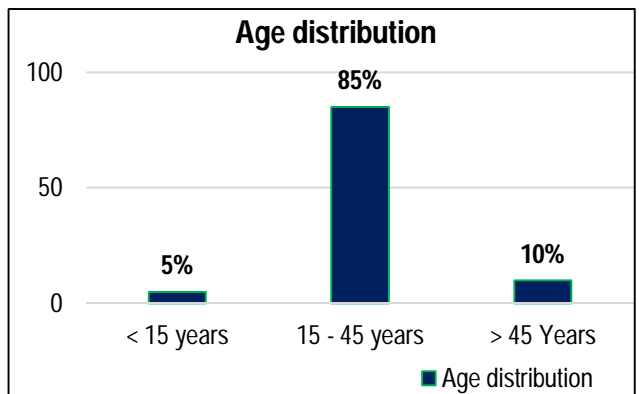


Figure-2: Distribution of patients by age group (n=2678)



Figure-3: Pseudomembrane formation

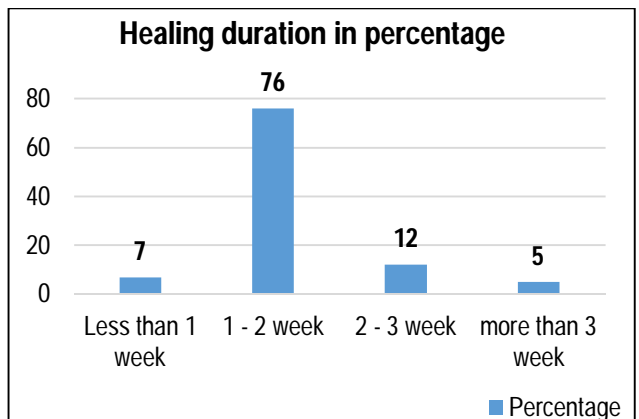


Figure-4: Duration of healing (n=2678)

Discussion

The hallmark of chronic phase of epidemic keratoconjunctivitis is the corneal involvement¹⁵. One study carried out by Butt and Chodosh¹⁵ found that 25.9% of patients demonstrated chronic corneal inflammation with symptomatic subepithelial infiltrates present for more than 45 days from appearance of the first sign, though in our study the percentage was very low.

In this study, cases were diagnosed clinically with laboratory study of conjunctival swab to exclude bacterial or fungal cause. PCR or any other laboratory test was not done due to lack of opportunity. In outpatient clinics it is difficult to distinguish clinically viral conjunctivitis from bacterial conjunctivitis^{1,3,5}. The gold standard for diagnosis of EKC is cell culture in combination with immunofluorescence staining (CC-IFA)^{3,5,6,7}. Other methods include serologic methods, antigen detection and polymerase chain reaction (PCR)^{1,3}.

In this study initially patients were treated with artificial tear and antibiotic then, after three days the cases presented with static or further deteriorated condition, treated with Ganciclovir eye gel, then after 2 weeks topical dexamethasone was applied. Steroid was used in 88% cases. One study mentioned that about 36% of eye care practitioners prescribed topical corticosteroids to treat EKC¹⁶. Topical corticosteroids are used when there is threat of impending visual loss from persistent subepithelial infiltrates, pseudomembranous conjunctivitis and iridocyclitis^{4,8,9,10,17}. Steroids suppress conjunctival and corneal inflammation and give symptomatic relief¹⁷.

Topical non-steroidal drugs do not have any role in adenoviral clearance. Artificial tears have shown relief of symptom to some extent^{18,19}. Topical Cyclosporine has shown some specific affect for treating subepithelial infiltrates²⁰.

Some researcher showed in experimental studies that corticosteroids can prolong the duration of viral shedding in varying degrees^{20,21,22}. One study found that long term treatment with 1% prednisolone acetate significantly altered immune response and potentially increased the risk of transmission of the epidemics¹⁸. Another study recommended that the risk and benefit of using corticosteroid must be weighed against the clinical benefit of short-term symptomatic relief²³.

In this study recovery was observed within 10 days in 60% cases of using Ganciclovir. A study carried out in Saudi Arabia compared the effects of ganciclovir 0.15% ophthalmic ointment with preservative-free artificial tears for 18 patients with adenovirus keratoconjunctivitis²⁴ where the ganciclovir group demonstrated resolution of the conjunctivitis in 7.7 days, as opposed to 18.5 days for the artificial tears patients group. The authors of this study concluded that topical ganciclovir 0.15% ophthalmic ointment is safe and effective for the treatment of adenoviral conjunctivitis.

Conclusion

Management of epidemic viral kerato-conjunctivitis is difficult due to nonspecific presentation. Most important challenge is to prevent permanent visual loss. Without specific features of bacterial or fungal conjunctivitis, patients of seasonal keratoconjunctivitis treated with Ganciclovir got prompt resolution which saved working hours of serving personnel. But treatment regimen for adeno-viral keratoconjunctivitis, needs to maintain a judicious case-by-case approach to prevent any visual consequence.

References

1. Sambursky R, Tauber S, Schirra F et al. The RPS Adeno Detector for diagnosing adenoviral conjunctivitis. *Ophthalmology*. 2006; 113:1758-64.
2. Lenaerts L, De ClercqE, Naesens L. Clinical features and treatment of adenovirus infections. *Rev Med Virol*. 2008; 18:357-74.
3. Rajaiya J, Chodosh J. New paradigms in infectious eye disease: adenoviral keratoconjunctivitis. *Arch SocEspOftalmol*. 2006; 81:493-8.
4. Cheung D, Bremner J, Chan JTK. Epidemic keratoconjunctivitis-do outbreaks have to be epidemic? *Eye*. 2003; 17:356-63.
5. Gottsch JD. Surveillance and control of epidemic keratoconjunctivitis. *Trans Am Ophthalmol Soc*. 1996; XCIV:539-87.
6. Melendez CP, Florentino MM, Martinez IL et al. Outbreak of Epidemic keratoconjunctivitis caused by adenovirus in medical students. *Mol Vis*. 2009; 15:557-62.
7. Kimura R, Migita H, Kadonosono K et al. Is it possible to detect the presence of adenovirus in conjunctiva before the onset of conjunctivitis? *Acta Ophthalmol*. 2009; 87:44-7.
8. Ford E, Nelson KE, Warren D. Epidemiology of epidemic keratoconjunctivitis. *Epidemiol Rev*. 1987; 9:244-61.
9. Lakkis C, Lian KY, Napper G et al. Infection control guidelines for optometrists 2007. *Clin Exp Optom*. 2007; 6:434-44.
10. Tyhurst KN, Hettler DL. Infection control guidelines: An update for the optometric practice. *Optometry*. 2009; 80:613-20.
11. Rhee DJ, Pyfer MF. *The Wills Eye Manual: Office and Emergency Room Diagnosis and Treatment of Eye Disease*. Philadelphia: Lippincott Williams & Wilkins; 1999:121.
12. Gordon YJ, Araullo-Cruz T, Romanowski EG. The effects of topical nonsteroidal anti-inflammatory drugs on adenoviral replication. *Arch Ophthalmol*. 1998; 116:900-5.
13. Shiuuey Y, Ambati BK, Adamis AP et al. A randomized, double-masked trial of topical Ketorolac versus artificial tears from treatment of viral conjunctivitis. *Ophthalmology*. 2000; 107:1512-7.
14. Hillenkamp J, Reinhard T, Ross RS et al. Topical treatment of acute adenoviral keratoconjunctivitis with 0.2% cidofovir and 1% cyclosporine. *Arch Ophthalmol*. 2001; 119:1487-91.
15. Butt AL, Chodosh J. Adenoviral keratoconjunctivitis in a tertiary care eye clinic. *Cornea*. 2006; 25:199-202.

16. Kowalski RP, Foulks GN, Gordon YJ. An overview comparing treatment regimens for ocular infections: community versus academia. *Ann Ophthalmol.* 2000; 32:295-300.
17. Romanowski EG, Yates KA, Gordon YJ. Topical corticosteroids of limited potency promote adenovirus replication in the Ad5/NZW rabbit ocular model. *Cornea.* 2002; 21:289-91.
18. Coli J. Ganciclovir ophthalmic gel, 0.15%: A valuable tool for treating ocular herpes. *Clin Ophthalmol.* 2007; 1:441-53.
19. Hillenkamp J, Reinhard T, Ross RS et al. The effects of cidofovir 1% with and without Cyclosporin A 1% as a topical treatment of acute adenoviral keratoconjunctivitis. *Ophthalmology.* 2002; 109:845-50.
20. Romanowski EG, Yates KA, Gordon YJ. Short-term treatment with a potent topical corticosteroid of an acute ocular adenoviral infection in the New Zealand white rabbit. *Cornea.* 2001; 20:657-60.
21. Tabbara KF, Al Balushi N. Topical ganciclovir in the treatment of acute herpetic keratitis. *Clin Ophthalmol.* 2010 ; 4 :905-12.
22. Isenberg SJ, Apt L, Valenton M et al. A controlled trial of povidone-iodine to treat infectious conjunctivitis in children. *Am J Ophthalmol.* 2002; 134:681-8.
23. Pelletier JS, Stewart K, Trattler W et al. A combination povidone iodine 0.4%/dexamethasone 0.1% ophthalmic suspension in the treatment of adenoviral conjunctivitis. *Adv Ther.* 2009; 26:776-83.
23. Isenberg SJ, Apt L, Campeas D. Ocular applications of povidoneiodine. *Dermatology.* 2002; 204(suppl 1):92-4.