Clinical and Virological Study of Conjunctivitis during the Epidemic in Calicut October - December 2006

Dr. Sheeja Viswanath MS, Dr. K S Chandrakanth DO DNB, Prof. (Dr). P. Vijayan MS, Prof. (Dr). Venkitachalam MS
Dr. Nirupama Balaji DO DNB, Dr. Tresa Mathew MS, Dr. Ramakrishnan MS

Abstract

9% of blindness in India is due to corneal diseases. With effective antimicrobials, and improved nutrition infective keratitis of non-viral origin and vitamin deficiency diseases are on the line of decline whereas viral keratitis tends to become more prevalent. Our aim was to analyse the clinical and virological aspects and to evaluate the efficacy of topical Acyclovir in preventing the development of keratitis. 55 patients were selected for virus isolation using human amnion and human lung cancer cells (AV-3 and A549). Adenovirus type 8 was isolated from 40%. All the cases including those having keratitis responded well with topical regimen. Our study highlighted the need for early and prompt institution of topical Acyclovir in preventing the development corneal complications and subsequent blindness.

Introduction

According to WHO, corneal diseases are the 2nd most common cause of blindness in the world today. A recent national survey conducted by the Govt. of India (1991-2001) estimated that the corneal lesions are responsible for 9% of all blindness in our country.

Majority of the causes of blinding corneal pathology are avoidable or preventable or treatable. Previously the corneal blindness was predominantly due to malnutrition, bacterial and fungal ulcers, followed by trauma. In the present era with improved nutrition and due to the advent of effective antimicrobials infective keratitis of non-viral origin are on the decline whereas viral keratitis has become more prevalent.

A variety of viruses can be responsible for conjunctival infection. Adenovirus is the most common and is highly contagious during the first 2 weeks of infection. It has the tendency to occur in epidemics. Ocular adenoviral infections are characterized by highly distressing local symptoms. It can occur with corneal involvement within 4-5 days after the onset of symptoms. The corneal lesions range from diffuse fine superficial punctate keratitis to epithelial defects and finally to sub epithelial nummular opacities which can last long, even for years. These nummular opacities can impair visual function significantly and can cause glare. Currently no specific antiviral therapy is available to shorten the course of infection or to improve distressful clinical symptom, to stop viral replication and to avoid the development of corneal opacities. Research is ongoing for topical agents that have anti viral activity. One drug
that holds promise in this area is cidofovir \(^4\). In 1996 Gordon et al \(^5\) first reported the clinical efficacy and safety of cidofovir in the treatment of the patient with proven acute kerato conjunctivitis \(^5\). To the best of our knowledge no study was reported regarding the efficacy of topical Acyclovir in the management of acute phase of viral conjunctivitis.

**Aim of Study**

The purpose of our study was to analyze the clinical and virological aspects and also to evaluate the efficacy of topical 3% Acyclovir eye ointment in the treatment of acute phase of viral conjunctivitis and also in the prevention of development of corneal opacities in the late phase.

**Materials and Methods**

A total of 55 patients with clinical features of acute viral conjunctivitis were studied at Malabar Eye Hospital during the epidemic in October - December 2006.

The diagnosis was made by clinical examination and confirmed by viral culture using human aminon cells and human lung cancer cells (AV-3 and A549). For virus isolation, conjunctival swabs taken from lower fornix were sent to Ooty and the results were analyzed. Only the acute cases of suspected viral conjunctivitis during the epidemic were included in the study. Conjunctival hyperemia, petechial and subconjunctival hemorrhages, involvement of preauricular lymphnode, coryza, the infiltration of cornea and the response to treatment were evaluated in all patients. The efficacy of treatment was studied in 2 main groups.

First group included patients coming after treatment elsewhere with antibiotic drops alone and without much relief, 2nd group coming primarily to us with typical signs and symptoms of viral conjunctivitis. The patients seen primarily by us were treated in 3 groups of 10 each. The division was based on the severity of clinical features as mild or severe. Family members of culture positive patients who developed mild symptoms of conjunctivitis with minimal congestion, chemosis, follicles and petechial hemorrhages in the upper tarsal conjunctiva with or without involvement of preauricular lymphnode were considered as mild. The remaining 20 cases with severe form of conjunctivitis were randomly divided into 2 treatment groups of 10 each (B1 & B2). Patients in group A (mild) were treated with antibiotic drops alone; group B1 (severe) with antibiotic-Acyclovir combination and group B2 with Acyclovir steroid antibiotic combination to the involved eye (the regime is given in table number II). All the patients treated outside were considered as severe and started on Type 3 regime.

Duration of treatment was for 21 days. Patients were followed up on 3\(^{rd}\), 7\(^{th}\), 14\(^{th}\), 21\(^{st}\) and 30\(^{th}\) day if required. At each visit, follicular reaction, conjunctival congestion and corneal involvement were documented.

**Observations and Discussion**

**Fig. 1. Age Incidence**

Total no: of pts.: 55

Maximum Age Incidence was between 20-40 yrs (40 %) followed by 40-60 yrs (27 %). Similar observations were made by Norn M.S \(^6\) (1974) who found that 59 % cases were adults.

**Fig. 2. Sex Incidence**

Total no: of pts.: 55

Out of 55 patients 29 (52.72 %) were males and 26 (47.28 %) were females. Gunderson \(^7\) (1938) in his study reported that both sexes were equally affected.
In 33 (62%) cases, the disease was unilateral and 22 (40%) cases bilateral. Khuran. A.K. et al. reported 35% bilaterality in 1984.

Table 1: Clinical Features

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>No: of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye ache</td>
<td>55</td>
<td>100 %</td>
</tr>
<tr>
<td>Foreign body sensation</td>
<td>55</td>
<td>100 %</td>
</tr>
<tr>
<td>Watering and discharge</td>
<td>55</td>
<td>100 %</td>
</tr>
<tr>
<td>Fever &amp; Throat pain</td>
<td>10</td>
<td>20 %</td>
</tr>
<tr>
<td><strong>SIGNS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre auricular lymphadenitis</td>
<td>24</td>
<td>43.63 %</td>
</tr>
<tr>
<td>Conjunctival congestion</td>
<td>55</td>
<td>100 %</td>
</tr>
<tr>
<td>Conjunctival Follicles</td>
<td>55</td>
<td>100 %</td>
</tr>
<tr>
<td>Sub conjunctival hemorrhage</td>
<td>10</td>
<td>10.90 %</td>
</tr>
<tr>
<td>Petechial hemorrhage</td>
<td>35</td>
<td>63.63 %</td>
</tr>
<tr>
<td>Corneal involvement</td>
<td>12</td>
<td>10.8 %</td>
</tr>
<tr>
<td>Uveitis</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Eye ache, foreign body sensation, watering and discharge were present in all cases. All patients had follicular type of conjunctival congestion (Table 1), 10 patients (20%) had fever and more often ocular symptoms started 2-3 days after the onset of coryza (Fig. 4).

Duration of Symptoms (Interval between the onset of symptoms and initial visit) Fig 4.

Viral culture was +ve in 40% cases and was found to be Adenovirus type 8. Out of 55 patients the sample of 23 patients were contaminated probably due to delay in sending the sample.

Type 8 Adenoviral conjunctivitis is a highly contagious disease. It is necessary to diagnose the disease on time for its proper management and all necessary steps should be taken to prevent transmission. According to many authors the treatment for viral conjunctivitis is only supportive. Other than Cidofovir which is found to be effective against the Type 5 Adenoviral conjunctivitis in rabbit model, no other antiviral drug is found effective against other strains of Adenovirus.
Treatment Regimen

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Group of patients to whom the treatment was instituted</th>
<th>Combination of medicines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Mild (A)</td>
<td>Antibiotic drops QID alone to the affected eye</td>
</tr>
<tr>
<td>Type 2</td>
<td>(B1)</td>
<td>Topical Acyclovir (3 % e/o 5 times daily) + antibiotic drops QID to the affected eye</td>
</tr>
<tr>
<td>Type 3</td>
<td>B2</td>
<td>Topical Acyclovir (3% e/o) with steroid antibiotic drops to the affected eye</td>
</tr>
</tbody>
</table>

In our study Acyclovir has demonstrated a significant antiviral activity in the early as well as late phase of Type 8 Adenoviral conjunctivitis. Moreover, the incidence of corneal infiltrate was found to be nil with the early application of Acyclovir.

Response to Treatment

Group 1 (consists of 25 patients treated outside with antibiotic drops alone.)- Started on type 3 regime.

Group 2 include 30 patients - Primarily treated here.

A1–10 Pts. with mild C F -Type I Regime
B 1–10 Pts. Treated- Type 2 Regime.
B2–10 Pts severe-Type 3 Regime.

With the application of antibiotic drops alone, the patients in group 2 A responded well and recovered completely from all symptoms within one week. This might be due to the high immune response of the individual or due to the low virulence of the organism. Even though all the patients in group 2 B1 and B2 responded well with topical regimen, the recovery was found to be faster in group 2 B2. This might be due to the use of Acyclovir, which might be preventing the virus multiplication in the early phase. The applied steroids also play an important role by accelerating the subjective improvement of clinical features by suppressing the polymorphonuclear leukocyte migration and capillary permeability.

In group 1, the patients who did not have keratitis, the symptoms markedly improved within 4 days and the clinical features completely resolved within 7 days, with the topical Acyclovir antibiotic steroid combination. In those patients who had Keratitis the corneal lesions resolved completely without any sequelae within the first 2 weeks of treatment. This might be because the lesions were not deep enough to disrupt the Bowmans membrane to involve the stroma. The use of Acyclovir along with the steroids might have prevented the progression of the natural course of the disease and accelerate the improvement of symptoms.

Conclusion

The inferences from our study are:

1. Early institution of topical Acyclovir can shorten the course of Adenoviral infection.
2. The use of topical Acyclovir with steroids enhances the efficacy of treatment.
3. Topical Acyclovir prevents the development of corneal infiltration when applied in the very early phase of Type 8 Adenoviral conjunctivitis.
4. The administration of antibiotic drops alone may not be safe in all cases.

<table>
<thead>
<tr>
<th>Clinical Features</th>
<th>3 DAYS</th>
<th>6th day</th>
<th>12th Day</th>
<th>21st Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gp1</td>
<td>Gp 2</td>
<td>Gp 1</td>
<td>Gp 2</td>
</tr>
<tr>
<td>Eye ache</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
</tr>
<tr>
<td>Fb sensation</td>
<td>25</td>
<td>6</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Water discharge</td>
<td>25</td>
<td>8</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>CC</td>
<td>25</td>
<td>10</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Follicles</td>
<td>25</td>
<td>10</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>Keratitis</td>
<td>10</td>
<td>4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>
5. Even in cases of Keratitis the administration of topical Acyclovir with steroid prevents the escalation of lesions into the deeper layers of the cornea there by reducing the chances of developing corneal opacities.

References

11. Gorden YJ, Romanowski E, Araullo – Cruz T, De Clercq E. Pretreatment with topical 0.1% (S hydroxyl – 2 – phosphonylmethoxypropyl) cytosine inhibits adenovirus type 5 replication in the new rabbit ocular model. Cornea. 1992;11:529-533

OPHTHALMIC HISTORY

Gerhard Rudolph Edmund Meyer- Schwickerath [1920-1992]

Prof. Padmaja Krishnan MS

(With lasers being the “in” thing in Ophthalmology today, here is the man who paved the way…..)

The power of sunlight to damage the retina was known from ancient times.

“People may injure their bodily eyes by observing and gazing on the sun during an eclipse, unless they take the precaution of only looking at the image reflected in the water or some similar medium"

-Socrates, quoted by Plato in ‘Phaedo’

Galileo injured an eye while looking at the sun with his newly invented refracting telescope, as did the father of photoagulation, Gerhard Rudolf Edmund Meyer-Schwickerath, while experimenting with the production of radiant energy.

Meyer-Schwickerath, the German ophthalmologist, was born in July 1920 at Wuppertal-Elberfeld, Germany. He left school in 1937 at the age of 17 and decided to become a doctor. This was against the family tradition of studying law as he did not fancy practising Law under the Nazi regime.

When the world war broke out, he joined up as a paramedic, but was sent back from the frontline after he sustained a knee injury. He was thus able to study Medicine, graduated in 1945, took up Ophthalmology and completed his Fellowship from Munster, Hamburg.

In 1952, he moved to the University of Bonn and in 1959 became Professor and Director of the University Eye Department in Essen, where he continued to work until his retirement in 1985.

Meyer-Schwickerath conceived the idea of therapeutic photo-coagulation when he was just 25 years old while trying to develop a diathermy machine to treat retinal detachment. He had been seeing a lot of patients, including one of his students, with macular burns from watching the