

## **Epidemic Adenoviral Conjunctivitis report of an Outbreak in a Military Garrison and Recommendations for its Management and Prevention**

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### **Abstract**

**Objective:** The study was conducted to document the cases of adenoviral conjunctivitis, evaluate its clinical patterns, prevent its transmission and reduce its severity and complications during an epidemic.

**Methods:** A total of 2968 cases of adenoviral conjunctivitis were documented during the months of June, July and August 2003. By simple randomization, 200 Patients were selected and divided into two groups on the basis of treatment. Group 1 (Treatment group) 40% patients were given topical anti-histamine/decongestant eye drops whereas Group 2 (Control group) 60% patients were managed conservatively by washing eyes with cold water and applying ice packs on the eyes.

**Results:** Highest incidence of the disease was seen in the month of July 2003. In most of cases (90%) both eyes of the respondents were affected. Acute illness lasted from 4.91 days in Group 1 and 7.86 days in Group 2. Commonly observed symptoms included redness, watering, itching, burning, pain in the eyes and photophobia. Duration of the illness was less and severity was mild in Group 1 patients as compared with Group 2 patients this was found to be statistically significant using T test ( $P < 0.05$ ). None of the cases reported any complication after complete recovery from adenoviral conjunctivitis.

**Conclusion:** Adenoviral conjunctivitis is a highly contagious disease and often spreads in epidemics, particularly in crowded communities with poor hygiene. Prevention of transmission is the most important therapeutic measure particularly in the ophthalmic clinics of the hospitals. Although the disease is benign and self-limiting, cold compresses and topical anti-histamine/decongestant eye drops reduce the discomfort and severity of the disease (JPMA 55:273;2005).

### **Introduction**

Adenovirus is the commonest cause of viral conjunctivitis.<sup>1</sup> Incubation period of the disease is one week and is highly contagious for several weeks after onset of the symptoms.<sup>2</sup> Generally viral conjunctivitis is benign and self-limiting. Epidemic keratoconjunctivitis (EKC) is commonly associated with subtypes 8,19 and sometimes 37.<sup>3,4</sup> Adults (20 to 30 years) are commonly affected. EKC

spreads in epidemics by person-to-person contact particularly in crowded places with poor hygiene e.g. schools, military camps and swimming pools.<sup>5,6</sup> Conjunctival infection causes extreme watering, redness and foreign body sensation called catarrhal conjunctivitis.<sup>7</sup> On examination, there is lid oedema, ptosis, conjunctival chemosis, watering. Conjunctival follicles and fine tarsconjunctival papillae of the lower lid are mainly

involved.<sup>8,9</sup> Corneal involvement causes intense photophobia due to punctate epithelial lesions.<sup>10</sup> Later, sub-epithelial infiltrates appear at the level of Bowman membrane as a hypersensitivity reaction to viral antigen that coalesces to form deeper sub-epithelial lesions called nummular keratitis.<sup>11,12</sup> Pre-auricular lymphadenopathy is common.

Diagnosis is generally based on clinical features alone. However, other causes of follicular conjunctivitis e.g. herpes simplex virus<sup>13</sup> and chlamydial infection should be excluded.<sup>14</sup> Adenoviral enzyme immunoassay is specific and confirmative.<sup>15</sup>

Prevention of transmission is the most important therapeutic measure particularly in the ophthalmic clinics of the hospitals. Hand washing with soap and water before and after examining each patient, thorough cleansing of instruments that touch the patient's eye and frequent changing of multiuse eye drops is extremely important.<sup>6</sup> Affected patients must be isolated for at least two weeks. Cold compresses, topical antihistamines, decongestants and non-steroidal anti-inflammatory agents reduce severity of the symptoms. Topical steroids should be avoided in the conjunctival infection, as they are known to prolong the course of disease.<sup>15</sup>

## Patients and Methods

The study was conducted in Malir Garrison from 01 June 2003 to 31 August 2003, the time when the epidemic of viral conjunctivitis started from Karachi including Malir Cantonment and later spread to almost entire country.

A record of all officers, troops and their families who suffered from viral conjunctivitis was maintained at Staff surgeon, Medical Reception Centre (MRC), Family out-patient department (Family OPD) of Combined Military Hospital (CMH), and six Health Care Centers (HCCs) of Malir Cantonment in the months of June, July and August 2003 (Table 1).

A study questionnaire was designed and response was obtained from 200 randomly selected Army personnel and their families and children who suffered from viral conjunctivitis during the epidemic. The questionnaire was pre-tested on a sample to ensure clarity of interpretation and ease of completion to improve validity of responses.

Patients (n=200) were divided into two groups on the basis of treatment. Group 1 patients (n=81) were treated with topical anti-histamine/decongestant (pheniramine maleate 0.3% and naphazoline hydrochloride 0.025%) whereas Group 2 patients (n=119) were treated conservatively by washing eyes with cold water and applying ice packs on the eyes.

## Results

Highest incidence of the disease was seen in the month of July 2003 (Table 1).

**Table 1. Cases of Viral Conjunctivitis (Year 2003) (n=2968).**

Department	June 2003	July 2003	August 2003
Staff Surgeon Department	14	148	172
Medical Reception Centers (MRCs)	47	926	422
Family Out-patient Department (OPD)	19	90	28
Health Care Centers (HCCs)	53	822	227
<b>TOTAL</b>	<b>133</b>	<b>1986</b>	<b>849</b>

Out of a total of 200 selected patients, both eyes were affected in 180 (90%) patients whereas single eye was affected only in 20 (10%) patients (Table 2).

**Table 2. Distribution of unilateral or bilateral eye involvement (n=200).**

Sr. No.	Distribution	Number	Percentage
1	Unilateral involvement	20	10%
2	Bilateral involvement	180	90%

Mean duration of illness in Group 1 was 4.91 days whereas it was 7.86 days in Group 2. Most commonly observed symptoms noted amongst the respondents induced redness of eyes, watering from the eyes, pain (including itching and burning) and photophobia. All the symptoms were graded from Grade 0 to 3 depending upon severity.

- Grade 0 Absence of any complaint
- Grade 1 Mild (+1)
- Grade 2 Moderate (+2)
- Grade 3 Severe (+3)

**Table 3. Symptoms with Duration.**

S.No.	Symptoms	Duration (in days)	
		Treatment Group	Control Group
1.	Redness of eyes	5 Days	8 Days
2.	Watering of eyes	4 Days	7 Days
3.	Pain, itching, burning	4 Days	6 Days
4.	Photophobia	3 Days	5 Days

Duration of the illness as well as severity of the symptoms was less and statistically significant in Group 1 Patients as compared to Group 2 ( $P = <0.05$ ). T test was used for statistical data analysis. None of the patients reported any complication after complete recovery from viral conjunctivitis. Table-3

## Discussion

Adenoviral conjunctivitis is the commonest type of viral conjunctivitis and frequently appears in epidemics. Although, it is benign and self-limited, it is highly contagious and spreads by exposure to the affected person, particularly through health care workers.<sup>5,6</sup> Conjunctival infection causes extreme watering, redness and foreign body sensation called catarrhal conjunctivitis. Epidemic keratoconjunctivitis (EKC) is commonly responsible for epidemics and is usually associated with subtypes 8 and 19.<sup>8</sup>

Purpose of our study was to minimize the patient's discomfort and to limit the spread of infection in the health care facilities specifically and in the Malir Garrison at large.

Patients were divided into two groups on the basis of treatment. Patients in Group 1 (40%) were treated with topical anti-histamine/decongestant (pheniramine maleate 0.3% and naphazoline hydrochloride 0.025%) whereas Group 2 patients (60%) were treated conservatively by washing eyes with cold water and applying ice packs on the eyes. Highest incidence of the disease was seen in the month of July 2003 when humidity was highest. In 90% cases both eyes were affected. Most commonly observed symptoms were redness of eyes, watering, itching, burning, photophobia and pain in the eyes. Duration of the illness as well as severity of the symptoms was mild and statistically significant in Group 1 patients as compared to Group 2 ( $P < 0.05$ ). Results were comparable with similar studies of Buerhler et al and Rosenbach et al.<sup>5,16</sup>

Prevention of transmission was given extreme importance in health care facilities of Malir Garrison. Hand washing with soap and water before and after examining each patient, thorough cleansing of instruments that touch the patient's eye and frequent changing of multiuse eye drops was carried out. Patients and their attendants were also advised to observe similar preventive measures to limit the spread of infection in their communities.

## Conclusions

Adenoviral conjunctivitis is a highly contagious dis-

ease and often spreads in epidemics, particularly in crowded communities with poor hygiene. It is extremely important to teach the masses about the nature of disease, treatment and prevention of its spread.

Prevention of transmission is the most important therapeutic measure particularly in the ophthalmic clinics of the hospitals. Hand washing with soap and water before and after examining each patient, thorough cleansing of instruments that touch the patient's eye and frequent changing of multiuse eye drops is extremely important.

Although the disease is benign and self-limiting, cold compresses and topical anti-histamine/ decongestant eye drops reduce the discomfort and severity of the disease.

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