Outbreak of Keratoconjunctivitis in Aberdeen

October 2001 – January 2002

Report of the Outbreak Control Team

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Jayne Leith, Health Protection Nurse Specialist

on behalf of the Outbreak Control Team
Acknowledgement

Dr Howie, Chairman of the Outbreak Control Team would like to express her thanks to the following for all the help and assistance received during the management of the outbreak and compiling the final report

- Staff in the Ophthalmology Department, Aberdeen Royal Infirmary
- Staff in Accident and Emergency, Aberdeen Royal Infirmary
- All members of the Outbreak Control Team
- Health Protection Team, NHS Grampian
- Infection Control team, NHS Grampian
- Diane McGregor, Health Protection Team, NHS Grampian

Members of the Outbreak Control Team

Dr Helen Howie  Consultant in Public Health Medicine, NHS Grampian  (Chair)
Roy Browning  Senior Infection Control Nurse (Primary Care)
Mr W Church  Consultant Ophthalmologist NHS Grampian
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Dr P Molyneaux  Consultant Medical Virologist, NHS Grampian
Gordon Porteus  Charge Nurse, Eye Department
Dr Tom Reid  Infection Control Doctor, NHS Grampian
Anne Smith  Senior Infection Control Nurse (Acute)
Diane McGregor  Secretarial support

Outbreak Control Meetings were held on
11 December 2001
17 December 2001
9 January 2002
13 February 2002
1. Introduction

In late October 2001 the staff at the Eye Casualty, Aberdeen Royal Infirmary (ARI), Grampian University Hospital Trust (GUHT) noticed a small increase in the number of individuals presenting with painful florid conjunctivitis with corneal changes. The first case presented on 24 October 2001. Between 24 October and 11 December eleven individuals presented at Eye Casualty with symptoms suggestive of epidemic keratoconjunctivitis (EKC). The Infection Control Team were informed in late November 2001 and control measures were put in place in Eye Casualty. The Accident and Emergency Departments (A&E) at ARI and the Royal Aberdeen Children’s Hospital (RACH) were advised of the problem. The Consultant Virologist informed Public Health on the 6 December. An incident team was convened on 11 December 2001 to review the situation, verify there was an outbreak of keratoconjunctivitis and agree any further investigation and control measures.

2. Keratoconjunctivitis caused by Adenovirus type 8

2.1 Signs and symptoms

There are many different serotypes of adenovirus and some serotypes commonly cause acute conjunctivitis. Keratoconjunctivitis associated with adenovirus serotypes 8, 19 or 37 may be transmitted within the hospital environment, especially ophthalmology departments, and can give rise to epidemics within the community.

The incubation period is around 4-12 days, but can be longer. The symptoms, which are usually of sudden onset include:

- red painful eye
- photophobia
- blurred vision
- sticky/watery discharge

The findings on examination include:

- follicles
- petechial haemorrhages on the conjunctiva
- chemosis - conjunctival swelling/oedema
- oedema of caruncle
- pseudo membranes – white exudate lining inside of the eyelids

Patients can also experience a low-grade fever, headache, malaise and tender lymph nodes.

Although only one eye is normally affected initially, the other eye may subsequently become infected. After about 7 days, 50% of cases develop corneal erosions and they may develop subepithelial infiltrates that can cause blurring of vision. The acute conjunctivitis may last for two weeks although the keratitis may continue to evolve.

Corneal involvement

- Stage 1 - Diffuse epithelial keratitis with large confluent corneal abrasions
- Stage 2 - Transient focal epithelial keratitis
Stage 3 - Sub epithelial infiltrates that may persist for months of years leading to disability but will usually resolve.

2.2 Transmission routes
The shedding of the virus occurs from late in the incubation period up to fourteen days after the onset of disease. The virus is present in the infected person's respiratory and eye secretions. Adenovirus can survive for long periods on environmental surfaces. Contaminated hands are a major source of person to person transmission. Within an eye clinic, inadequately decontaminated instruments e.g. tonometer heads are a potential route.

2.3 Treatment
The treatment of keratoconjunctivitis mainly involves alleviating the symptoms with eye lubrication and analgesics. Prophylactic antibiotics are given since the cornea is disrupted. Steroids have not been demonstrated to shorten the course of the condition. Analgesics may be required for pain relief.

3. Epidemiological investigation and results
Adenovirus type 8 is rarely isolated from samples submitted to the virology laboratory in Grampian. No increase had been identified in other parts of Scotland during the outbreak.

3.1 Case definition

3.1.1 Clinical case
An individual presenting with symptoms compatible with epidemic keratoconjunctivitis (EKC) between 1 October 2001 and 31 January 2002 with a clinical diagnosis by an ophthalmologist.

3.1.2 Probable case
An individual who had contact with a positive adenovirus type 8 case and presented with at least three of the following between 1 October 2001 and 31 January 2002 and was not examined by an ophthalmologist or swabbed.

- Ocular redness
- Swelling
- Tearing or watery discharge
- Photophobia
- Ocular pain or discomfort
- Foreign body sensation

3.1.3 Possible case
As in probable case definition but without contact with a positive case.

3.1.4 Confirmed case
Clinical, probable or possible case with adenovirus type 8 isolated.

3.2 Data collection methods
A outbreak specific surveillance form was designed by the Public Health Department to capture essential information including demographics, symptoms, and potential risk factors (Appendix 1). The information was entered onto an Access database in the Public Health Department.
3.3 Case ascertainment

3.3.1 Cases interviewed retrospectively
Staff at the Eye Casualty ARI reviewed patient notes of attendees from the 24 October. The details of those who fulfilled the case definitions were passed to Public Health. The patients were interviewed over the telephone by the Public Health Infection Control Nurses (PHICNs) using the locally designed questionnaire. Any similarly affected contacts of cases were identified, interviewed and given infection control advice and asked to attend their GP so eye swabs could be taken and sent to the virology laboratory at GUHT.

3.3.2 Prospective cases
The medical or nursing staff at Eye Casualty at ARI, A&E at ARI and RACH completed the questionnaire with individuals presenting with suspected EKC. The questionnaires were sent to Public Health who followed up any contacts of these individuals who were identified with similar symptoms.

GP’s were advised to refer any possible cases of EKC to Eye Casualty at ARI. The emergency out of hour’s service was advised to refer cases to ARI or RACH A&E departments as appropriate.

3.4 Age, sex and time
A total of 104 suspected cases of EKC were identified, 61 females and 43 males with an age range of 1 to 90 years old. A total of 71 questionnaires were completed. The date of onset of symptoms ranged from 22 October 2001 to the 20 January 2002. See epidemic curve below.
3.5 Reported symptoms

Table 1 Reported symptoms (Total 71)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Left eye</th>
<th>Right eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red eye</td>
<td>48</td>
<td>46</td>
</tr>
<tr>
<td>Swollen eye</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>Discharge from eye</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>Photophobia</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>Blurred vision</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td>Pain in eye</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Discomfort</td>
<td>35</td>
<td>36</td>
</tr>
</tbody>
</table>

3.6 Potential risk factors within the incubation period for confirmed adenovirus type 8 cases

The first case presented at the eye casualty on the 24 October having undergone an eye examination as part of a routine investigation for an unrelated problem whilst on holiday in Malta nine days earlier. Although this connection was followed up, there was no ongoing or previously identified outbreak of EKC in Malta.

During the interviews of cases reporting symptoms starting between 22 October and 2 December 2001 it was noted that a common factor was visiting the ARI Eye Casualty and/or opticians or being a close contacts of individuals who have attended the above.

Table 2. Potential risk factors within the incubation period among the nine patients with EKC and in whom Adenovirus type 8 was isolated

<table>
<thead>
<tr>
<th>Case</th>
<th>Potential risk factors within incubation period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>Attended eye outpatients</td>
</tr>
<tr>
<td>Case 2</td>
<td>Works in an opticians</td>
</tr>
<tr>
<td>Case 3</td>
<td>Household contact of case 2</td>
</tr>
<tr>
<td>Case 4</td>
<td>Household contact of an individual who attended eye outpatients</td>
</tr>
<tr>
<td>Case 5</td>
<td>Household contact of case who attended Maltese hospital</td>
</tr>
<tr>
<td>Case 6</td>
<td>In a Maltese hospital</td>
</tr>
<tr>
<td>Case 7</td>
<td>Attended eye out patients</td>
</tr>
<tr>
<td>Case 8</td>
<td>Contact of an individual who attended eye out patients</td>
</tr>
<tr>
<td>Case 9</td>
<td>Contact of an individual who attended eye out patients</td>
</tr>
</tbody>
</table>

4. Virological investigation and results

4.1 Adenovirus isolation techniques

4.1.1 Standard Culture Method

The standard method depends on the ability of the virus to penetrate and infect susceptible cells. MRC5 cells are used in the virology laboratory at ARI. These are a type of Human Lung Embryo fibroblast that are bought commercially. The swab specimen is agitated on receipt at the laboratory to liberate any virus-infected cell from the swab, and about 0.2 ml of the
transport medium is added to the cell culture tube. Different viruses produce different cytopathogenic effects (CPEs) on the cell sheet, which can be seen under the microscope. A CPE that is suggestive of adenovirus is confirmed by immunofluorescence, using an antibody that should react with all adenovirus serotypes, and, separately, an antibody that will react only with adenovirus type 8. Adenoviruses are fairly slow growing, particularly adenovirus 8, so the tubes are examined twice weekly for CPE for a minimum of 3 weeks.

4.1.2 Enhanced Culture (Shell vial testing)
The virology laboratory introduced shell vial testing at the end of November when it was suspected that there was an outbreak of EKC.

This is an enhanced culture method that uses 1cm diameter coverslips with a layer of MRC5 cells growing on them in 1 – 2 ml of culture medium, instead of cells growing in tubes. Rather than just dropping 0.2 ml of transport medium from the swab into a culture tube, the specimen is added to the shell vial, which is then centrifuged at 2500 rpm for 30 minutes to 1 hour. After 48 or 72 hours incubation at 37°C, the medium is removed from the vial, the coverslip is washed in buffer, and then fixed in methanol. The coverslip is again washed, and then the adenovirus antibody is added. This is incubated for 45 minutes, then the coverslip is again washed, mounted on a slide, and observed using an ultraviolet microscope.

Infected cells show brilliant apple green fluorescence against a reddish brown counter staining of uninfected cells. The method of staining for adenovirus type 8 is slightly more complicated, involving an extra stage.

This enhanced (shell vial) culture method gives approximately the same sensitivity or greater than standard culture, but within 2-3 days rather than around 3 weeks. Shell vial testing is not routinely used due to the cost of reagents and because the process is more labour intensive. The technique can be adapted for many different viruses where a more rapid result than conventional culture is required.

4.2 Equipment
Some tonometer heads that were in direct contact with patient’s eyes were randomly sampled for adenovirus. One tonometer head out of the four tested was positive for adenovirus.

4.3 Human virological results
Wherever possible, viral swabs were obtained from the conjunctiva of patients with symptoms compatible with EKC. Table 3 shows summary of results.

<table>
<thead>
<tr>
<th>Table 3 Human results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of suspected cases</td>
</tr>
<tr>
<td>Positive for adenovirus type 8</td>
</tr>
<tr>
<td>Positive for adenovirus, not type 8</td>
</tr>
</tbody>
</table>
5. Control measures

Eye Casualty, Eye Clinic, Accident and Emergency Department and Eye Ward  For Infection Control Guidance - see appendix 2

Initial control measures in Eye Casualty included:

• Triage and segregation of patients presenting with red eye
• Improved hand hygiene
• No tonometry on patients with red eyes
• Clean slit lamp with sodium hypochlorite 0.1% (1000 ppm available chlorine), followed by washing with water and detergent and drying

Additional control measures were agreed at the OCT on the 11 December 2001.

• A designated waiting area and examination room with designated equipment was used solely for patients with suspected adenovirus.
• The reading material was removed from the waiting area.
• Stopped transfer from A&E to Ward 30 of patients with serious eye complaints out of hours. Patients with suspected EKC seen in A&E by ophthalmology staff to reduce the risk of transmission to other parts of the hospital.
• No further tonometry to be performed on patients with acute red eyes until disposable tonometer heads were available. Tonometer heads were the only pieces of equipment in direct contact with patients’ eyes.
• Decontamination of tonometer heads was reviewed and changed from 0.0125% to 0.1% hypochlorite solution.
• The importance of thorough hand hygiene was stressed to all staff in Eye Casualty, A&E ARI and the ophthalmology ward ARI. This included one to one and group teaching sessions arranged by the GUHT Infection Control Nurses. Advice was also given regarding the appropriate use of personal protective clothing.
• Decontamination protocols were distributed to eye casualty, both ARI and RACH A&E departments and the ophthalmic ward at ARI. This included advice that the designated waiting and examination areas were to be cleaned each day using sodium hypochlorite 1000 ppm.

5.2 Patient advice

Public Health staff telephoned all suspected cases reported to have EKC prior 11 December 2001 and gave advice regarding hygiene and exclusion periods. The Public Health Information leaflet on EKC was posted to the case (Appendix 3).

The Public Health Information Leaflet was distributed to affected patients attending the Eye Casualty and A&E departments at ARI. This was supplemented with verbal advice from the nursing and medical staff regarding hygiene and exclusion periods.
A separate Conjunctivitis Information leaflet was developed for use with those patients where staff considered the diagnosis to be simple conjunctivitis (Appendix 4).

5.3 Exclusion
Any person with confirmed or suspected EKC was advised to remain off work or school for fourteen days after the onset of symptoms or until the inflammation had subsided, whichever was longer.

5.4 Community
When possible cases attended community care facilities e.g. nursery schools, care homes, infection control advice was given. Workplace infection control advice was given as appropriate by the Public Health Infection Control Nurse e.g. decontamination of eye protection worn by possible cases.

6. Communication

6.1 Patients
Two Information Leaflets were developed one for patients with symptoms suggestive of EKC and one for patients presenting with simple conjunctivitis. The Public Health telephone number was on the advice sheets so patients could, if required, gain further information, see Appendices 3 and 4.

6.2 Medical and Nursing staff
Staff at the Eye Clinic were advised verbally in late November 2001. A&E staff at ARI, RACH and Dr Grays Hospital Elgin were informed of the outbreak 14 December 2001. A further letter was sent on 11 January 2002 (Appendix 5).

6.3 General Practitioners
General Practitioners and Out of hours Primary Care Co-operatives were alerted to the situation on 14 December 2001 (Appendix 5)

6.4 Opticians
Chair of Area Optometric Committee was advise and all opticians were alerted to the outbreak by letter 14 December. The GUHT Infection Control protocol was attached (Appendix 5).

6.5 Senior NHS Staff
The Director of Public Health, SCIEH and the SEHD were advised and kept updated.

7. Discussion
One hundred and four suspected cases of EKC were reported to Public Health. The first case of EKC was seen at the Eye Clinic on 24 October. The onset date of the last case was 20 January 2002. Although the outbreak was not reported to Public Health until 6 December 2001, control measures had been put in place by the Infection Control Team when it was reported in late November. Several factors contributed to the late identification including the difficulty and length of time to isolate the virus and the small number of cases initially.

The diagnosis of EKC relies on both clinical and laboratory parameters. The virus is difficult to culture. After identification of this outbreak the standard laboratory virus isolation technique was supplemented with the shell vial
enhanced culture method which is more sensitive. Twenty-eight samples were positive for adenovirus and nine of these were positive for adenovirus type 8.

Outbreaks of adenovirus type 8 associated with centres concerned with eye care have been reported in the literature. This was supported in Grampian where local investigation revealed an increased risk associated with attendance at the ARI eye outpatients department. When an increase in the number of cases was noted, the GUHT Infection Control Team assessed infection control practice in the Eye Outpatient Clinic. Some concerns including the decontamination of tonometry heads and adequate hand decontamination between patients in the clinic were noted. Infection control advice and training were given. This outbreak coincided with Department of Health guidance advising on the use of disposable tonometer heads to reduce the risk of transmission of vCJD. This resulted in a national shortage of disposable tonometer heads.

The literature suggests that once adenovirus is introduced to an eye care facility, it is likely to become wildly disseminated. However, in the Grampian outbreak, only a small number of cases were identified suggesting good staff compliance with the recommended infection control procedures.

Sources of expert advice in managing similar outbreaks in the UK were limited and advice was sought from the Royal College of Ophthalmologist, Moorfields Eye Hospital, the Microbiologist at Dumfries Royal Infirmary who had managed a similar incident, and the Centre for Disease Control in Atlanta. Articles in the literature were sought and selected references are given for the benefit of those managing similar outbreaks in the future.

8. Recommendations

1. There should be early involvement of Public Health in outbreaks that affect both hospital and community.

2. Ideally disposable tonometer heads should be used for all patients and a business case should be developed.

3. If disposable tonometer heads are not available decontamination should comply with current guidance, which is aimed at prevention of transmission of vCJD. Tonometer heads should be decontaminated using a 2% solution of hypochlorite. There must be appropriate precautions in place to reduce risk of corneal burns i.e. rinsing heads with saline prior to use.

4. Increased infection control training for all staff.
References


Appendix 1
GRAMPIAN NHS BOARD
Eye Questionnaire

<table>
<thead>
<tr>
<th>Surname</th>
<th>Forename</th>
<th>Date of Birth</th>
</tr>
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<tbody>
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<table>
<thead>
<tr>
<th>Address</th>
<th>Telephone Number</th>
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<tbody>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Where employed</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

Do you wear protective eye equipment at work?
Yes/No

If at school, name and address

Year

GP Name & Address

<table>
<thead>
<tr>
<th>Symptoms experienced</th>
<th>Left Eye</th>
<th>Date of onset of symptoms</th>
<th>Right Eye</th>
<th>Date of onset of symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discomfort</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Eye/eye lid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swelling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge</td>
<td></td>
<td></td>
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<tr>
<td>Photophobia</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Blurred vision</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign Body sensation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other symptoms</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Are you still symptomatic (Yes/No)

Date symptoms ceased

12
<table>
<thead>
<tr>
<th><strong>Do you know others with similar eye problems (Y/N)</strong></th>
<th><strong>If Yes, Name and Address 1</strong></th>
<th><strong>Name and address 2</strong></th>
<th><strong>Name and address 3</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date of Birth (if known)</strong></td>
<td><strong>Date of Birth (If known)</strong></td>
<td><strong>Date of birth (If known)</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Who has physically touched your eyes in the month before this recent infection?:</strong></th>
<th><strong>Yes/No</strong></th>
<th><strong>When</strong></th>
<th><strong>Where</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GP</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optician</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Eye Clinic Staff</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Have you visited any swimming pools since September 1st? (Y/N)</strong></th>
<th><strong>If Yes, dates</strong></th>
<th><strong>Which ones?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th><strong>Additional notes:</strong></th>
<th><strong>Advice Given</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Thorough Hand washing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Not to share any objects eg face towels etc</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>To administer eye drops yourself if possible</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Not to participate in water or contact sports</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Adenovirus leaflet given</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Handwashing leaflet given</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Exclusion from work/school discussed</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Signed……………………………….Date………………………………..
INFECTION CONTROL PROTOCOL
KERATOCONJUNCTIVITIS

TRIAGE
On arrival at department note presence of eye discharge or redness. Enquire re visit to eye clinic, general practitioner or optician with recent eye problems.

Identify an exposure to anyone with a history of red eyes or eye discharge during the last month.

SEGREGATE
Patients presenting with above symptoms or a positive exposure history are directed to the designated waiting area.

EXAMINATION
Identified room available for the examination of patients. Flat surfaces free of clutter and all non-essential equipment removed.

Use disposable equipment where appropriate.
Wear disposable gloves during the examination of patients. Meticulous hand washing after the removal of gloves and between treating patients, using Chlorhexidine 4%.
Administer eye drops using procedure to prevent cross-contamination.
Avoid procedures such as tonometry and use of lenses where possible.

INFORMATION
Ensure patients receive a copy of the information leaflet

DISINFECTION
Immerse reusable instruments in a solution of sodium hypochlorite 1000ppm available chlorine, for 10min. Rinse thoroughly and dry.

Use sodium hypochlorite 1000ppm available chlorine:
• Between patients, wipe down all surfaces that they may have touched.
• At the end of the day, wipe down flat surfaces e.g. dressing trolleys, storage shelves in the examination room and waiting room.
Sodium hypochlorite is a corrosive substance, wash metal surfaces e.g. stainless steel trolleys with a fresh solution of detergent and hand hot water after disinfection.

METICULOUS HAND HYGIENE IS THE MOST IMPORTANT PROCEDURE IN THE PREVENTION OF INFECTION SPREAD.

Compiled by GUHT Infection Control December 2001
APPENDIX 3
GRAMPIAN NHS BOARD

CONJUNCTIVITIS CAUSED BY ADENOVIRUS

**What is it?**

Conjunctivitis is inflammation of the delicate lining that covers the front of the eye and lines the inside of the eyelids. Bacteria, viruses, allergies, physical or chemical irritation can cause conjunctivitis. Some infections, particularly those caused by a virus called adenovirus can cause a severe infection of this lining, eyelids and tissue surrounding the eye.

Because of the complex laboratory tests involved it may take up to three weeks to confirm the cause of your conjunctivitis.

**What are the symptoms?**

The incubation period is around 4-12 days but this can often be longer. Symptoms are usually sudden onset of:

- ‘Red eye’
- Painful eye
- Photophobia (dislike of bright lights)
- Blurred vision
- Watery / sticky discharge from the eye

Occasionally patients may experience a low grade fever, headache, malaise and swollen glands in front of the ears.

Around 7 days after onset of illness about 50% of cases may develop raw areas on the cornea which may cause eye pain and sensitivity to light. Later on white spots on the cornea may interfere with your vision occasionally making driving difficult. Complete recovery always occurs but may take some time.

**How is it spread?**

Adenovirus is easily spread from person to person.

Hands can be contaminated by:

- Direct contact with the eye secretions of an infected person.
- Indirectly through contaminated surfaces, instruments, solutions or household articles eg pillow cases, towels etc.
What precautions must I take?

- Avoid touching your eyes unnecessarily
- Thorough hand washing using liquid soap, particularly after touching your eyes, nose or any part of your face.
- Do not share any objects that may have come in contact with your eyes including towels, pillows and face makeup etc.
- Dispose of any tissues promptly into the waste.
- Towels, pillow cases etc should be washed at the hottest wash appropriate for the fabric.

All household members should adhere to the above precautions

In particular you should

- Dispose of all makeup that has come in contact with your eyes.
- Discard used disposable contact lenses.
- Wear you glasses until your optician has assessed your eyes. This assessment should take place two weeks after complete recovery.
- In addition please do not participate in any water or contact sports
- If you have been prescribed eye drops please administer them yourself if possible

Will I require treatment?

There is no specific medication available for this virus therefore treatment relies on relieving the symptoms. Your Doctor will advise appropriately.

Can I go to work/school?

Since adenovirus is easily spread and can cause a severe infection you should not go to work/school until fourteen days after the onset of symptoms. You should continue to stay off work/school if the inflammation has not cleared within this fourteen-day period of exclusion.

If you require further information please contact the Public Health Team on 01224 558520
What is conjunctivitis?
Conjunctivitis means inflammation of the delicate membrane covering the front of the eye and the lining inside the eyelids. It can be caused by bacterial or viral infections, by allergic reactions e.g. to dust and pollen or by physical or chemical irritation.

What are the symptoms?
Depending on the cause of the conjunctivitis, the incubation period can vary from 24 hours up to around one month. The symptoms include:

- Watery, “sticky” eyes
- Yellow/green discharge from the eyes
- Red, swollen itchy eyes

How is it spread?
Conjunctivitis can be very easily spread particularly in the early stages of the infection. The spread of infection is more common between children and household members. It can be spread by:

- Direct contact with eye and respiratory secretions of an infected person
- Indirectly through contaminated surfaces, solutions, instruments and household items such as clothing, towels, face flannels, tissues, make-up etc

What precautions must I take?
Handwashing is the most effective way to prevent the spread of infection. Hands should be washed thoroughly after:

- Administering eye drops/ointment to an infected person
- Touching infected eyes or any items that have come into contact with the eyes
- Sneezing/nose blowing and discarding of used tissues

Use liquid soap and ensure that family members use their own towel and face flannel.
Other precautions should include not sharing any eye make-up and not wearing contact lenses whilst eyes are sore.

Will I need treatment?
This will depend on the cause of the conjunctivitis. Treatment of the symptoms only may be advised by your GP, however, if it is thought that the cause is bacterial, antibiotics may be prescribed.

Will I need to stay off school/work?
Infected individuals should stay off nursery, school or work during the acute stage of the infection, which is normally the first 48 hours. It is reasonable to return after 24 hours of treatment with an appropriate antibiotic. If your doctor thinks your conjunctivitis is caused by a particular virus you may be advised to stay off for considerably longer and at least until your symptoms have settled.

If you require further advice please contact your general practitioner
Dear Colleagues

Outbreak of keratoconjunctivitis

Since the end of October there has been an increase in the number of patients presenting to eye casualty with acute keratoconjunctivitis. Adenovirus 8 has been cultured in some samples and this virus is known to cause epidemics of keratoconjunctivitis.

Cases present with an acute infection affecting one or both eyes with inflammation of the conjunctiva, oedema of the eyelids and periorbital tissues. Onset is sudden with discomfort or pain, photophobia, watery discharge, blurred vision and occasionally low grade fever, headache, malaise and tender preauricular lymphadenopathy. After about 7 days 50% of cases develop corneal erosions and they may develop subepithelial infiltrates that can cause blurring of vision. The acute conjunctivitis may last for two weeks although the keratitis may continue to evolve. The patient may have blurred vision for several weeks or months. The period of communicability is from late in the incubation period for 14 days after onset.

This virus is spread very easily from person to person directly by contact with secretions and indirectly from contaminated surfaces, instruments, solutions, towels, face cloths etc.

This letter includes guidance on the management of patients presenting with acute red eyes and I have enclosed:

- An Infection control protocol
- Patient information leaflets for you to give to your patients depending on the clinical presentation:
  - If patients present with the symptoms suggestive of keratoconjunctivitis please give leaflet entitled ‘Conjunctivitis caused by adenovirus’
  - If patients present with simple conjunctivitis please give leaflet entitled ‘Conjunctivitis’
These have been prepared in consultation with a Consultant Ophthalmologist and the Infection Control Team at GUHT.

In addition we would appreciate you giving out The Get To Grips With Germs handwashing leaflet which is available from Health Promotions.

**Guidance on management**

If a patient attends the surgery with an acute red eye please minimise exposure to other patients as this virus is easily spread from person to person. If a patient contacts the surgery for an appointment please try to see them at the end of surgery.

If the patient presents with discharge, swelling and a red eye but **no pain or visual disturbance** please treat as follows:
- Symptomatic treatment with eye lubrication e.g. viscotears or hypromellose 0.3% qds or as required
- Prophylactic antibiotics e.g. chloramphenicol ointment or drops qds.
- No steroids

If the patient presents with discharge, swelling, red eye **plus pain or visual symptoms** e.g. constant blurring please refer to Eye Casualty at Aberdeen Royal Infirmary between 9-4.30pm Monday to Friday. To minimise exposure to other patients please encourage your patients to attend after 3pm. If you need urgent advice out of hours please contact the Ophthalmology SHO/Registrar through the ARI switchboard.

If patients present with symptoms suggestive of keratoconjunctivitis they should not be at school or work for two weeks from the onset of symptoms or until their symptoms have settled.

I have enclosed a copy of the Infection Control Protocol prepared by the Infection Control Team for GUHT. This has obviously been written for the hospital setting but I would like to draw your attention to the importance of meticulous hand hygiene and the use of gloves when examining a patient with an acute red eye.

Thank you very much for your assistance in this matter. If you have any queries please contact Public Health.

Yours sincerely,

**Helen Howie**

**DR HELEN HOWIE**
Consultant in Public Health Medicine (CD&EH)
Dear Colleagues

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  - If patients present with simple conjunctivitis please give leaflet entitled ‘Conjunctivitis’
These have been prepared in consultation with a Consultant Ophthalmologist and the Infection Control Team at GUHT.

**Guidance on management**

If a patient attends Accident and Emergency with an acute red eye please minimise exposure to other patients as this virus is easily spread from person to person. You should already have received a copy of the Infection Control Policy prepared by the Infection Control team but I have enclosed a copy for ease of reference.

If the patient presents with discharge, swelling and a red eye but **no pain or visual disturbance** please treat as follows:

- Symptomatic treatment with eye lubrication e.g. viscotears or hypromellose 0.3% qds or as required
- Prophylactic antibiotics e.g. chloramphenicol ointment or drops qds.
- No steroids

If the patient presents with discharge, swelling red eye **plus pain or visual symptoms** e.g. constant blurring please discuss with the Ophthalmology SHO/Registrar. To minimise exposure to other patients **do not** send to Ward 30 without discussing with ophthalmology first.

If patients have symptoms suggestive of keratoconjunctivitis they should not be at work or school for two weeks or until their symptoms have settled.

Please keep an accurate list of patients details (name and address and if possible telephone number) presenting to A&E with acute red eyes and advise Public Health on 01224 558520.

Thank you very much for your assistance in this matter. If you have any queries please contact Public Health.

Yours sincerely,

**DR HELEN HOWIE**

Consultant in Public Health Medicine (CD&EH)
Dear Colleagues

Outbreak of keratoconjunctivitis

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This virus is spread very easily from person to person directly by contact with secretions and indirectly from contaminated surfaces, instruments, solutions, towels, face cloths etc. We are advising patients with symptoms suggestive of keratoconjunctivitis not go to school or work for two weeks from onset of symptoms or until their symptoms have settled.

Guidance on management

If someone presents with an acute red eye to an optician please refer them to their GP or to eye casualty. If attending eye casualty please advise patients to attend after 3pm to minimise exposure to other patients.

I have enclosed a copy of the Infection Control Protocol prepared by the Infection Control Team for GUHT. This has obviously been written for the hospital setting but I would like to draw your attention to the importance of meticulous hand hygiene and the use of gloves if you do examine a patient with an acute red eye.
Thank you very much for your assistance in this matter. If you have any queries please contact Public Health.

Yours sincerely,

DR HELEN HOWIE
Consultant in Public Health Medicine (CD&EH)
Grampian NHS Board
Public Health Directorate
Communicable Disease &
Environmental Health

Summerfield House
2 Eday Road
Aberdeen AB15 6RE

Date                  8th January 2002
Your Ref
Our Ref
Enquiries to
Direct Line         01224 558520
Ext                      58520
Fax No                01224 558566
Email

To all
Ophthalmology – medical and nursing staff
Urgent and confidential

Dear Colleagues

Outbreak of keratoconjunctivitis - update

New patients are still presenting to Eye casualty and Accident and Emergency with symptoms suggestive of acute keratoconjunctivitis. Adenovirus 8 has been cultured in some samples and this virus is known to cause epidemics of keratoconjunctivitis. I would like to take this opportunity to remind you of the control measures.

This virus is spread very easily from person to person, directly by contact with secretions and indirectly from contaminated surfaces, instruments, solutions, towels, face cloths etc. Please refer to the Infection Control Protocol – Keratoconjunctivitis and contact Anne Smith, Infection Control Nurse, on 52118 if you require further copies. Meticulous hand hygiene is the most important way of preventing spread of this infection.

Please advise patients with symptoms suggestive of keratoconjunctivitis that they should not be at work or school for two weeks or until their symptoms have settled. Please also ensure they are given a copy of the Information Sheet.

Accident and Emergency staff have been asked to discuss any patients who presents with discharge, swelling, red eye plus pain or visual symptoms e.g. constant blurring with the Ophthalmology SHO/Registrar. To minimise exposure to other patients A&E staff have been asked not to send patients to ward 30 without discussing with ophthalmology first.

Please could all Ophthalmology SHOs who see patients in Accident and Emergency with symptoms suggestive of keratoconjunctivitis complete a questionnaire for each patient. These questionnaires are available in A&E and should be forwarded to Public Health. Address labels have been sent to the A&E department.
I would like to thank all the staff for their assistance in managing this outbreak. Further copies of questionnaire and information sheet are available from Public Health on 01224-558520.

Yours sincerely,

DR HELEN HOWIE
Consultant in Public Health Medicine (CD&EH)
TO ALL
Accident and Emergency staff
ARI
Urgent and confidential

Dear Colleagues

Outbreak of keratoconjunctivitis - update

New patients are still presenting to Eye casualty and Accident and Emergency with symptoms suggestive of acute keratoconjunctivitis. Adenovirus 8 has been cultured in some samples and this virus is known to cause epidemics of keratoconjunctivitis. I would like to take this opportunity to remind you of the management and control measures.

If the patient presents with discharge, swelling and a red eye but no pain or visual disturbance please treat as follows:
- Symptomatic treatment with eye lubrication e.g. viscotears or hypromellose 0.3% qds or as required
- Prophylactic antibiotics e.g. chloramphenicol ointment or drops qds.
- No steroids

If the patient presents with discharge, swelling, red eye plus pain or visual symptoms e.g. constant blurring please discuss with the Ophthalmology SHO/Registrar. To minimise exposure to other patients do not send to Ward 30 without discussing with ophthalmology first.

This virus is spread very easily from person to person, directly by contact with secretions and indirectly from contaminated surfaces, instruments, solutions, towels, face cloths etc. If a patient attends Accident and Emergency with an acute red eye please minimise exposure to other patients. Please refer to the Infection Control Protocol - Keratoconjunctivitis you received before Christmas. Please contact Anne Smith, Infection Control Nurse, on 52118 if you require further copies. Meticulous hand hygiene is the most important way of preventing spread of infection.

Please advise patients with symptoms suggestive of keratoconjunctivitis that they should not be at work or school for two weeks or until their symptoms have settled. Please also ensure they are given a copy of the Information Sheet.
Please keep an accurate list of patients details presenting to A&E with acute red eyes and who are referred to Ophthalmology. The Ophthalmology SHOs have been asked to complete a short questionnaire and these should be forwarded to Public Health (address labels are included).

I would like to thank all the staff in Accident and Emergency for their assistance in managing this outbreak. Further copies of questionnaire and information sheet are available from Public Health on 01224-558520.

Yours sincerely,

DR HELEN HOWIE
Consultant in Public Health Medicine (CD&EH)