Conjunctivitis

Professor Gregory Peterson
Unit for Medication Outcomes Research and Education (UMORE)
School of Pharmacy, University of Tasmania

Learning Objectives
On completion of this module, the pharmacist should be able to discuss:

1. the features and causes of conjunctivitis; and

2. approaches to the management of infective conjunctivitis, including the rational use of topical antibiotics.

Competencies Assessed
Functional area 1: Practice pharmacy in a professional and ethical manner
   Unit 3: Pursue life-long professional learning and contribute to the development of others
Functional area 3: Promote and contribute to optimal use of medicines
   Unit 1: Participate in therapeutic decision making
   Unit 2: Provide ongoing pharmaceutical management
   Unit 3: Promote rational drug use
Functional area 6: Provide primary health care
   Unit 1: Assess primary health care needs
   Unit 2: Address primary health needs of patients (Elements 1-2)
   Unit 3: Promote good health in the community (Elements 2-3)
Functional area 7: Provide medicines and health information and education
   Unit 3: Disseminate information

Mrs. JW, a regular customer to the pharmacy, presents to the pharmacy complaining of red eyes, which feel irritated and have a discharge, with some ‘glueing’ of the eyelids in the morning. She has had this for almost 2 days. Her vision is not affected. Her young daughter had the same symptoms a few days ago, but it seemed to quickly resolve.
Conjunctivitis is one of the most common diseases in childhood, occurring in about one in eight children each year.\textsuperscript{1,2} It also probably accounts for 1% to 2% of all GP consultations.\textsuperscript{3,4} The health care cost implications of conjunctivitis are significant. It is estimated, for instance, that the total direct and indirect cost of treating patients with bacterial conjunctivitis alone in the United States is approximately US$600 million per annum.\textsuperscript{5}

Conjunctivitis refers to any inflammation of the conjunctiva, the transparent surface covering the white of the eye. It is generally characterised by superficial irritation or grittiness, itching, foreign body sensation, and watering or discharge.\textsuperscript{6} The main causes are infections (viruses or bacteria), allergens, dryness and irritants.

This article is focused on infective conjunctivitis. However, it is important to remember that in Australia, the most common causes overall in adults and children are not infective - but allergy and dry eyes.\textsuperscript{7} The latter is particularly common in the elderly. A one-year prospective study of over 400 patients with conjunctivitis attending the Royal Victorian Eye and Ear Hospital’s emergency department found that only one-third had a treatable microbial cause.\textsuperscript{7}

It is not easy to clinically differentiate a viral from a bacterial conjunctival infection. Essentially, despite having clinically suggestive signs and symptoms of bacterial conjunctivitis, the diagnosis can be incorrect in approximately 50% of cases.\textsuperscript{3} A survey of general practitioners in the UK in 2002 found that only 36% felt that they could correctly differentiate between acute bacterial and viral conjunctivitis.\textsuperscript{8} Although not having an extensive evidence base, the traditional criteria for differentiating bacterial from other types of conjunctivitis have included the presence of a sticky yellow-white mucopurulent discharge or glued eyes (particularly in the morning on waking; viral conjunctivitis is more likely to have a watery discharge), bilateral infection, and an absence of itching (Table 1).\textsuperscript{6} Vision should not be impaired. Most infective conjunctivitis cases in adults are probably due to viral infection, but children are more likely to develop bacterial conjunctivitis than viral forms.\textsuperscript{6}

Viral conjunctivitis, most commonly caused by an adenovirus, is usually preceded by a recent cold, sore throat, or exposure to someone with the condition. Individuals suffering from viral conjunctivitis often have a “pink eye” with a watery discharge. Viral conjunctivitis is usually self-limiting, with symptoms resolving over one to 3 weeks. It can be treated symptomatically with cold compresses applied several times a day, artificial tears, and topical vasoconstrictors.\textsuperscript{9-11} Topical antibiotics are rarely necessary because secondary bacterial infections are uncommon. Viral conjunctivitis can be very contagious; therefore, thorough hand washing, not sharing towels, and proper disposal of tissues should be reinforced.\textsuperscript{9}

This, of course, leads to one of the major practical problems with infective conjunctivitis - day care centres, kindergartens and schools do not like to have children with conjunctival discharge
among the other children. They are rarely generally ill but have to stay at home, with all the problems that makes for the families, including a possible loss of earnings for the family. It is known that social factors, including the need for children to attend day care or school and parents to go to work, contribute to the decision to prescribe antibiotics for children with acute infective conjunctivitis.

Table 1: Comparison of bacterial and viral conjunctivitis
(modified from Cronau et al.\textsuperscript{10})

<table>
<thead>
<tr>
<th>Condition</th>
<th>Signs</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viral</td>
<td>Normal vision, normal pupil size and reaction to light, diffuse conjunctival redness</td>
<td>Mild to no pain, occasional gritty discomfort with mild itching, watery discharge, often unilateral at onset with second eye involved within one or two days</td>
</tr>
<tr>
<td>Bacterial</td>
<td>Eyelid oedema, preserved visual acuity, conjunctival redness, normal pupil reaction, no corneal involvement</td>
<td>Mild to moderate pain with stinging sensation, red eye with foreign body sensation, mild to moderate purulent discharge, bilateral glued eyes upon awakening (best predictor)</td>
</tr>
</tbody>
</table>

Bacterial conjunctivitis is highly contagious and is most commonly spread through direct contact with contaminated fingers. The main bacterial pathogens are \textit{Staphylococcus} species (\textit{aureus} or \textit{epidermis}), \textit{Haemophilus influenzae}, \textit{Streptococcus pneumoniae} and \textit{Moraxella catarrhalis}. Contact lens wearers may be more likely to develop gram-negative infections. Bacterial keratitis occurs rarely in up to 30/100,000 contact lens wearers. It is an infection of the cornea accompanying acute or subacute corneal trauma; it is more difficult to treat than conjunctivitis and can threaten vision.

Debate continues about the need to treat bacterial conjunctivitis with topical antibiotics. Most bacterial conjunctivitis is self-limiting. One systematic review found clinical cure or significant improvement with placebo within 2 to 5 days in 65% of people. In a randomised double-blind trial, over 300 children aged 6 months to 12 years with a clinical diagnosis of acute infective conjunctivitis were recruited from 12 general medical practices in the UK. Treatment was with either chloramphenicol eye-drops (0.5%) or placebo eye drops, to be instilled every 2 hours for the first 24 hours when the child was awake and then four times daily until 48 hours after the infection had resolved. Eye swabs were taken for bacterial and viral analysis. Pathogenic bacteria were cultured from about 80% of the children: about 60% of these were \textit{H. influenzae}, about 20% \textit{S. pneumoniae}, and about 10% \textit{M. catarrhalis}. Adenovirus or picornavirus (or both) were detected from more than 10% of children.
The primary outcome was clinical cure at day 7, which was assessed from diaries completed by parents. Clinical cure by day 7 occurred in 83% of children with placebo compared with 86% with chloramphenicol. It was concluded that most children presenting with acute infective conjunctivitis in primary care will get better by themselves and do not need treatment with an antibiotic. The authors suggested that parents should be encouraged to treat children themselves without medical consultation, unless their child develops unusual symptoms or the symptoms persist for more than a week. Similarly, Australia’s Therapeutic Guidelines state that “64% of cases of acute bacterial conjunctivitis spontaneously remit within 5 days. Symptoms may however last up to 14 days if untreated. About 1 in 5 will benefit from treatment, with a shortened duration of symptoms.”

If treatment is initiated, it has been suggested that almost any broad-spectrum topical antibiotic can be used with the expectation of success. Options available in Australia include dibromopropamidine/propamidine (Brolene), sulfacetamide (Bleph-10), chloramphenicol, framycetin, gentamicin, tobramycin, tetracycline, ciprofloxacin and ofloxacin. The Therapeutic Guidelines suggest:

- In mild cases, use:
  - propamidine 0.1% eye drops, 1 to 2 drops 3 to 4 times daily for 5 to 7 days.
- In severe cases, use:
  - chloramphenicol 0.5% eye drops, 1 to 2 drops every 2 hours initially, decreasing to 6-hourly as the infection improves. Chloramphenicol 1% eye ointment may be used at bedtime
  OR
  - framycetin 0.5% eye drops, 1 to 2 drops every 1 to 2 hours initially, decreasing to 8-hourly as the infection improves.

Gentamicin, tobramycin and quinolone eye drops are substantially more expensive than the recommended drugs and are generally unnecessary for empirical treatment.

In the UK since 2005, chloramphenicol eye drops 0.5% have been available without prescription through pharmacies, under the supervision of a pharmacist, for the treatment of acute bacterial conjunctivitis in adults and children over the age of 2 years with a maximum treatment duration of 5 days. This was extended to include chloramphenicol 1% eye ointment in 2007. Not surprisingly, concern has been expressed in the UK about the availability without prescription and the associated aggressive marketing of chloramphenicol eye drops in cases of self-diagnosed conjunctivitis, given the evidence that most children with acute infective conjunctivitis in primary care will get better by themselves and do not need treatment with an antibiotic.
At its October 2009 meeting, the National Drugs and Poisons Schedule Committee determined that chloramphenicol for ophthalmic use will also become a Schedule 3 drug in Australia, from 1 May 2010, in harmonisation with New Zealand. While this will increase the range of over-the-counter options available to treat presumed bacterial conjunctivitis, it should not radically alter pharmacists’ approach to managing this condition.

The most appropriate and commonly recommended management strategy for suspected bacterial conjunctivitis is to provide reassurance, delay topical antibiotic use and promote supportive care, such as frequent eye cleansing with sterile water and cotton balls, warm water compresses, proper hand and eyelid hygiene, and temporary use of artificial tears for comfort. If the symptoms of conjunctivitis do not begin to improve within 2 days of proper supportive management, it is then sensible to begin a topical antibiotic. In essence, in people with suspected bacterial conjunctivitis, empirical treatment with topical antibiotics may be beneficial. However, this benefit is so marginal that it is advisable to suggest that patients use antibiotics only if symptoms do not resolve after 1 to 2 days. Commencing topical antibiotic therapy is reasonable in “high risk” individuals, including patients who are in a hospital or other health care facility, patients with immune compromise or diabetes mellitus, children going to schools or day care centres that require antibiotic therapy before returning, and health care workers.

Therefore, delaying antibiotic therapy is an option for acute bacterial conjunctivitis in most patients. A shared decision-making approach is appropriate, and many patients are willing to delay antibiotic therapy when counselled about the self-limiting nature of the condition. This “delay” style of management was evaluated in a randomised controlled trial that involved over 300 adults and children with acute bacterial conjunctivitis diagnosed clinically by GPs in southern England. The study compared outcomes among patients prescribed antibiotic drops immediately, not at all, or in a delayed fashion. The delayed approach was to provide counselling and a patient information leaflet, and give a prescription that could be filled 2 to 3 days after diagnosis at the patient’s discretion for worsening or persistent symptoms. This approach reduced antibiotic use compared with immediate prescribing, despite similar duration and severity of symptoms. The patients identified their lack of awareness of the self-limiting nature of conjunctivitis as an important reason for requesting antibiotics. However, when properly educated about the natural progression of the condition, they were prepared to do without prescriptions for antibiotics. Clearly, pharmacists should routinely provide education to consumers seeking over-the-counter treatments for presumed infective conjunctivitis.

The potential risk to vision that is inherent with eye complaints requires that pharmacist understand the most common disorders of the eye, as well as the signs and symptoms that require
immediate referral to a doctor/optometrist or to hospital (Table 2). If eye pain is moderate or severe or visual acuity is reduced, more serious causes (such as uveitis or acute keratitis) need to be considered.

**Table 2: Suggested referral criteria for patients presenting with ‘conjunctivitis’**

<table>
<thead>
<tr>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant eye pain</td>
</tr>
<tr>
<td>Impaired vision</td>
</tr>
<tr>
<td>Unilateral red eye</td>
</tr>
<tr>
<td>Photophobia</td>
</tr>
<tr>
<td>Recent ocular surgery or trauma</td>
</tr>
<tr>
<td>Contact lens use</td>
</tr>
<tr>
<td>Suspected foreign body in the eye</td>
</tr>
<tr>
<td>Condition has lasted more than 5 days</td>
</tr>
</tbody>
</table>

Returning to our case, Mrs. JW should be provided with education and reassurance by her pharmacist. She should be advised that she probably has bacterial conjunctivitis, which resolves spontaneously within 2 to 5 days in more than half of people without treatment, as appears to have occurred in her daughter. Topical antibiotics may speed up clinical and microbiological cure of bacterial conjunctivitis, but the benefit is very small. Symptomatic management could include frequent eye cleansing with sterile water and cotton balls, warm water compresses, and temporary use of artificial tears for comfort. She should wash her hands often and not share towels or pillows. If the symptoms do not begin to improve within 2 days of proper supportive management, it would then be appropriate to begin using a topical antibiotic.
References

MCQs for conjunctivitis

1. Which one of the following statements about conjunctivitis is **FALSE**?
   a. It can be caused by allergy
   b. It is often misdiagnosed
   c. It can be caused by irritants
   d. Most cases are due to bacterial infection
   e. It is a common condition

2. Infective conjunctivitis in adults is most often due to:
   a. adenovirus
   b. *H. influenzae*
   c. *S. pneumoniae*
   d. *M. catarrhalis*
   e. *N. gonorrhoeae*

3. Which of the following symptoms is the best indication of bacterial conjunctivitis?
   a. Profuse watery discharge
   b. Red eye with foreign body sensation
   c. Bilateral glued eyes upon awakening
   d. Mild to moderate purulent discharge
   e. Unilateral initially, with second eye involved within one or two days

4. Which of the following is generally the most appropriate management strategy for suspected bacterial conjunctivitis?
   a. Ciproflocaxin eye drops
   b. Chloramphenicol eye drops
   c. Framycetin eye drops
   d. Aciclovir eye ointment
   e. Provide reassurance, delay topical antibiotic use and promote supportive care

5. Which of the following factors does **NOT** necessarily warrant medical or optometrist referral by the pharmacist?
   a. Significant eye pain
   b. Impaired vision
   c. Photophobia
   d. Age over 65 years
   e. Condition has lasted more than 5 days