

Conjunctivitis: A review

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Background

General practitioners (GPs) face the challenge of diagnosing conjunctivitis accurately and confidently. Conjunctivitis and red eye are common presentations that confer diagnostic uncertainty. GPs are pivotal in diagnosing and managing conjunctivitis-like symptoms, making them a critical first port of call for patients. Accurately identifying and treating this common eye infection can help ensure the best possible outcomes.

Objective

This article presents an overview of conjunctivitis, exploring its causes and how to accurately assess and diagnose. We also discuss how to safely refer patients for investigation and provide appropriate safety netting.

Discussion

Conjunctivitis can be secondary to a range of conditions, commonly viral, bacterial and allergic pathogens. It tends to be a self-limiting disease; however, symptoms might persist for up to three weeks. Accurate clinical diagnosis for conjunctivitis is difficult, and thus it can be useful to send a swab for polymerase chain reaction and culture to confirm the diagnosis.

CONJUNCTIVITIS is a common presentation to general practitioners (GPs), accounting for approximately 1% of all primary care presentations.¹ It affects patients across all age groups and any socioeconomic class.² Approximately 70% of all patients with acute conjunctivitis present to primary and emergency health services,³ and in children, 66.6% of all eye-related problems that presented to the GP are related to conjunctivitis.⁴

Conjunctivitis is typically a non-sight-threatening, self-limiting condition that needs to be distinguished from sight-threatening conditions such as gonorrhoea, chlamydia, herpes simplex virus (HSV), uveitis and microbial keratitis (MK).

The heterogeneity of clinical presentations of conjunctivitis is influenced by the underlying cause. Aetiology depends on a patient's age, risk factors and season.⁵

Viral conjunctivitis is the most common cause of infectious conjunctivitis in the adult population.⁵ Bacterial conjunctivitis is the second most common infectious cause in adults and is responsible for the majority of paediatric cases.⁶ Allergic conjunctivitis is the most common non-infective cause, affecting between 15% and 40% of the population.⁷

Aim

This article outlines the key considerations when evaluating patients with suspected conjunctivitis. It will provide GPs with the confidence to accurately diagnose and manage this common condition, while ensuring appropriate referrals and safety netting are provided.

Discussion

Conjunctivitis is characterised by inflammation of the conjunctiva, a thin, clear membrane that covers the inside of the eyelid and over the sclera to the limbus. The inflammation leads to dilation of the conjunctival vessels, leading to hyperaemia and oedema. It is typically associated with discharge.⁸

The most common causes of conjunctivitis are viral, bacterial and allergic. Viral conjunctivitis is caused by viruses such as adenovirus and is typically the most contagious form. Bacterial conjunctivitis is caused by a variety of pathogens, such as *Staphylococcus aureus* and *Streptococcus pneumoniae*, and is less common. Allergic conjunctivitis is typically caused by allergen exposure, leading to an inflammatory response.⁸

It is important to accurately diagnose the cause of conjunctivitis to inform the correct treatment. The diagnosis is made through a combination of clinical judgement, taking into account the patient's history and symptoms, as well as relevant tests.⁸ Refer to Table 1 for a summary of the key features of viral, bacterial, allergic, chlamydial and gonococcal conjunctivitis.

Viral conjunctivitis

Viral conjunctivitis is the most common infectious, and most contagious, conjunctivitis. It can have a prolonged course, with incubation and communicability ongoing for five to 14 days.⁸

Viral conjunctivitis is often caused by adenovirus (65–90% of cases), although it can be caused by other viruses.⁹

Table 1. Key features of viral, bacterial, allergic, chlamydial and gonococcal conjunctivitis

Aetiology	History	Examination	Investigations	Management	Additional notes
Viral	<ul style="list-style-type: none"> Red eye, tearing, burning and serous/sticky discharge (often noted on waking) Recent URTI or contact with infected person (3–5 days) Might transmit from one eye to the other (2–3 days) 	<ul style="list-style-type: none"> Pseudomembranes might be present Preauricular lymphadenopathy is more prevalent 	<ul style="list-style-type: none"> Viral swab for PCR (ensure includes adenovirus) 	<ul style="list-style-type: none"> Symptomatic Specialist referral if significant pseudomembrane formation Limit follow-up as highly contagious If ongoing symptoms in 2–3 weeks, re-review with GP/optometrist and refer if concerned 	<ul style="list-style-type: none"> Highly contagious Self-limiting Commonly: adenovirus Usually resolves in 2–3 weeks
Bacterial	<ul style="list-style-type: none"> Bilateral or unilateral red eye Acute with rapid progress, or subacute onset (moderate to severe) Triad of strong predictors: <ul style="list-style-type: none"> Bilateral matting of eyelids Not itchy No history of recent conjunctivitis 	<ul style="list-style-type: none"> Hyperaemia Chemosis 	<ul style="list-style-type: none"> Bacterial swab of discharge for microscopy and culture If prolonged, consider swab for chlamydia PCR 	<ul style="list-style-type: none"> Symptomatic Empiric antibiotics: broad-spectrum eye drops (eg chloramphenicol) as per local guidelines Specialist referral for contact lens wearers to exclude microbial keratitis 	<ul style="list-style-type: none"> Self-limiting Commonly: staphylococcal species, <i>Streptococcus pneumoniae</i> Children commonly affected Usually resolves in 7–10 days
Allergic	<ul style="list-style-type: none"> Other allergic/atopic history is common Itch (pathognomonic) Erythema, watering, discharge Discomfort, eye pain 	<ul style="list-style-type: none"> Lid oedema, diffuse conjunctival erythema and mild swelling Slit lamp examination: papillae formation on conjunctiva 	<ul style="list-style-type: none"> Nil specific 	<ul style="list-style-type: none"> Symptomatic – can include topical antihistamines (eg olopatadine, ketotifen) or systemic antihistamines Allergen avoidance Specialist referral if unable to control symptoms with antihistamines (topical+systemic) 	
Chlamydial	<ul style="list-style-type: none"> Prolonged episode of conjunctivitis Typically unilateral Simultaneous or previous STI exposure 	<ul style="list-style-type: none"> Watery serous discharge 	<ul style="list-style-type: none"> Chlamydia PCR 	<ul style="list-style-type: none"> Systemic antibiotics including azithromycin/doxycycline as per local guidelines 	<ul style="list-style-type: none"> Topical antibiotics are not beneficial
Gonococcal	<ul style="list-style-type: none"> Acute onset hyperpurulent conjunctivitis 	<ul style="list-style-type: none"> Copious purulent/mucopurulent discharge 	<ul style="list-style-type: none"> Gram stain 	<ul style="list-style-type: none"> 1 g ceftriaxone (IV/IM) immediately plus cover for other STIs as clinically suspected 	<ul style="list-style-type: none"> Sight threatening

GP, general practitioner; IM, intramuscular; IV, intravenous; PCR, polymerase chain reaction; STI, sexually transmissible infection; URTI, upper respiratory tract infection.

Viral conjunctivitis is highly transmissible, commonly through contaminated swimming pools and contact with contaminated objects. Transmission occurs in 10–50% of cases.⁵

Bacterial conjunctivitis

Bacterial conjunctivitis can be caused by a range of bacteria, most commonly pathogens from staphylococcal species, followed by *S. pneumoniae* and *Haemophilus influenzae*. It is seen more commonly in children, although the type and origin can vary depending on the child's age.⁸ The disease might be bilateral or unilateral and typically lasts seven to 10 days.

Bacterial conjunctivitis can be contracted directly from infected individuals, through abnormal proliferation of native conjunctival flora or from the spread of infection from the organisms colonising the patient's nasal and sinus mucosa.

Allergic conjunctivitis

Allergic conjunctivitis occurs in response to a transient (eg pollen) or persistent (eg house dust mite) allergen.

History

A good-quality history can indicate the cause of conjunctivitis in many cases and should include duration of symptoms, nature of symptoms, contact lens wear and any other associated features.

Viral conjunctivitis

Patients typically present with symptoms including red eye, tearing, burning and sticky discharge. The discharge is typically most notable on waking. The condition might transmit from one eye to the other. This typically occurs two to three days after the first eye is involved.

Patients will often report recent contact of someone with red eyes (incubation three to five days prior) or have symptoms of a recent upper respiratory tract infection.

Bacterial conjunctivitis

There are two broad varieties of bacterial conjunctivitis: conjunctivitis with hyperacute (<24 hours) onset of severity associated with rapid progression; and conjunctivitis with acute or subacute onset (moderate to severe severity).

Sticky eyelids might be present in approximately 90% of affected individuals.¹⁰ Purulent secretion and ocular burning might be associated, but are less common.⁸

The combination of three signs, namely bilateral matting of the eyelids, lack of itching and no previous history of conjunctivitis, are strong predictors of bacterial conjunctivitis.¹¹

If the patient describes a hyperacute history of conjunctivitis with copious amounts of purulent discharge, there should be clinical suspicion for gonococcal conjunctivitis, which is a sight-threatening disease.¹²

Allergic conjunctivitis

Patients with allergic conjunctivitis will usually describe symptoms such as erythema, watering, discharge, discomfort or eye pain. Itching is the most pathognomonic symptom because it is rare in other ocular conditions.¹³

Other history

Other important points to clarify on history include a recent history of foreign body or chemical ocular injury, because this necessitates a different approach to treatment.

Approach to examination of the eye

A similar approach to examination might be followed for all cases of suspected conjunctivitis, and different clinical findings will help guide decision making around the most likely underlying aetiology.

It is important to use personal protective equipment when examining a patient with suspected conjunctivitis due to the potential of the pathogen to be highly contagious. Ensure to follow good hand hygiene, wear gloves and use a cotton bud to examine and touch the eye lids. It is important to thoroughly clean all equipment following examination, to prevent potential spread to other patients and to the practitioner (Box 1).¹⁴

Follow a systematic approach to the eye. Start by measuring visual acuity in both eyes. Review the lids, lid margin and conjunctiva; lid oedema, chemosis and subconjunctival haemorrhage might be present. Evert the upper and lower eyelids (this might be best completed after installation of topical anaesthetic to ensure patient comfort and compliance with examination). Ensure to

check for a foreign body. Look carefully for any pseudomembranes because they can be difficult to identify. They appear as yellow–white fibrin-rich 'sheets' that layer over the conjunctiva and should be removed to prevent symblepharon formation (an abnormal condition in which the bulbar and palpebral conjunctiva form an abnormal adhesion to each other). It is also important to examine for preauricular lymphadenopathy, because lymphadenopathy is more prevalent in viral conjunctivitis.⁹

Ensure to check the eyelid margin, because blepharitis can frequently be a contributing factor towards the development of conjunctivitis-like symptoms. Findings associated with blepharitis include erythema and oedema of the eyelid margin, oily scale

Box 1. Approach to a viral clean^A

1. Start by identifying the areas of the practice that have been exposed to the virus. This includes any surfaces that have been touched or have come in contact with the virus-carrying individual, such as doorknobs, chairs, desks or other surfaces.
2. For all objects and surfaces exposed to the virus, use a cleaning agent to clean the area. Ensure that the cleaning agent is effective against the virus and is approved for use in medical settings.
3. After cleaning the exposed surfaces, use a disinfectant to disinfect the area. This will kill any remaining virus particles that might not have been removed during the cleaning process.
4. Allow the disinfectant to remain in contact with the surface for the required period of time.
5. After the disinfectant has been left on the surface for the necessary amount of time, use a clean cloth to wipe away any remaining residue.
6. Once the area has been cleaned and disinfected, it is important to monitor the area for any additional virus particles or other contaminants that might have been missed during the process.

^AAdapted from Department of Health and Aged Care. Information about routine environmental cleaning and disinfection in the community. Australian Government, 2022. Available at www.safetyandquality.gov.au/ourwork/infection-prevention-and-control/environmental-cleaning-and-infection-preventionand-control-resources, with permission from the Australian Government.¹⁴

or greasy crusting of the lashes or (if using a slit lamp) obstructed meibomian glands.

Ensure to instil fluorescein and examine the cornea, checking for any fluorescein uptake. There are often punctate epithelial erosions notable over the cornea. Ensure to exclude a dendrite, because this suggests HSV keratitis. Other differentials with fluorescein uptake can include MK or marginal keratitis, which require ophthalmic review.

Common findings

Common findings in bacterial conjunctivitis include hyperaemia, chemosis and large amounts of purulent or mucopurulent discharge.

Common findings in allergic conjunctivitis include lid oedema, diffuse conjunctival injection and mild swelling. On slit lamp examination, papillae over the palpebral conjunctiva might be observed.

Investigation, management and follow-up

Viral conjunctivitis

Investigations

The rate of clinical accuracy in diagnosing viral conjunctivitis is less than 50%. Viral conjunctivitis is often misdiagnosed as bacterial conjunctivitis.⁹ A swab for viral polymerase chain reaction (PCR; ensure the local viral panel includes adenovirus) is useful to confirm the diagnosis. If available, point-of-care testing for adenovirus can be used, although a PCR should usually also be sent for confirmation.¹⁵

Management

Symptomatic management is the mainstay of treatment. Regular cool compresses to the eyes, as well as lubricant drops as required, can be effective in managing symptoms and patient discomfort.

If there is notable pseudomembrane formation, refer to an ophthalmic specialist for removal. If there is difficulty accessing specialist services, pseudomembranes can be removed by running a cotton bud across the surface of the palpebral conjunctiva. If resistant, fine forceps can be used; this is best done using the slit lamp, and should only be attempted if the practitioner is confident with slit lamp examination. Topical anaesthetic should be

used in all cases. If pseudomembranes are present, regular topical steroids will need to be used. These should be provided in conjunction with either an ophthalmologist or optometrist.

If possible, recommend that the patient book an appointment for review towards the end of the optometrists' or ophthalmologists' clinic due to the highly infectious nature of the disease.

Follow-up

Limit in-person follow-up initially due to the infectious nature of the disease. The patient should be given several weeks of leave to reduce the risk of transmission. If the symptoms worsen or do not resolve within two to three weeks, the patient should be re-reviewed by the GP and referred on if there are ongoing concerns.

Consider a telephone review at one week with the swab result, because patients might find this comforting.

Discharge information

It is important to educate the patient about the natural history of the condition. Key features include that it is a self-limiting disease and can worsen in the first few days. Viral conjunctivitis usually resolves in two to three weeks. The patient should maintain contact precautions to minimise spread. These precautions include regular hand washing, and no sharing of linen and towels. The condition remains contagious for 10–14 days after symptoms appear and while the eyes are symptomatic.

Consider the patient's profession; a medical certificate is often required for up to 14 days due to the highly infectious nature of the disease.

If the patient is a contact lens wearer, they should discard the previous lens/es and resume wearing contact lenses (with new lenses) once they have been asymptomatic for one week.

Bacterial conjunctivitis

Investigations

If there is copious discharge, a bacterial swab should be sent for microscopy and culture.

If there is a prolonged course of conjunctivitis, consider swabbing and sending for chlamydia PCR.

If there is concern for gonococcal conjunctivitis, a swab should be sent for urgent Gram staining because the condition is sight threatening.

Management

Most cases of bacterial conjunctivitis are self-limiting and will self-resolve within one to two weeks of presentation. There are no significant differences among the various broad-spectrum antibiotic eye drops in achieving a clinical cure. Antibiotics will decrease the period of infectivity, although there is limited benefit.¹⁶

Initial empiric therapy for acute non-severe bacterial conjunctivitis is a broad-spectrum antibiotic (such as chloramphenicol) four times daily for five to seven days. When prescribing antibiotic eye drops, it is worth considering whether the patients have had any issues with previous eye drops (including preservatives), because these can cause ongoing ocular hyperaemia and irritation. Antibiotic ointments might also be used, because these are frequently preservative free. If using an ointment, ensure to educate the patient that ointments are quite viscous and can cause blurred vision following application, because this might limit the patient's use of therapy.

Symptomatic management, using regular cool compresses to the eyes, as well as lubricant drops as required, can be effective in managing symptoms and patient discomfort.

Gonococcal conjunctivitis should be treated with 1 g intravenous or intramuscular ceftriaxone immediately.¹⁷ Co-treat with 1 g oral azithromycin to cover for chlamydia and investigate for other sexually transmissible infections. The patient should have same-day ophthalmology review, because gonococcal conjunctivitis is an ocular emergency and can lead to corneal melt and perforation.

All contact lens wearers should be referred to an optometrist or ophthalmologist for review to ensure there is no evidence of MK or marginal keratitis.

Follow-up

Most cases of bacterial conjunctivitis are self-limiting and do not require follow-up. If symptoms last beyond one week, consider other potential contributing factors and referral as necessary. If the conjunctivitis is not resolving, ensure investigate chlamydia as a potential cause.

Allergic conjunctivitis

Investigations

None needed.

Management

Baseline management involves allergen avoidance and symptomatic management. Topical antihistamines (such as olopatadine) can be useful in reducing symptoms, although it might take several weeks before a full effect is seen. Some of these antihistamines can initially cause a stinging sensation within the eyes, and so patients might be reluctant to use them. Systemic treatment with oral antihistamines might help alleviate symptoms.

If unable to control symptoms with both topical and oral antihistamines, consider referring to an ophthalmic practitioner for the addition of topical steroids.

Differential diagnoses

Blepharitis

Blepharitis is one of the most commonly encountered ocular disorders, affecting up to 40% of the population.¹⁸

Common symptoms include erythema, a burning sensation, irritation, tearing, eyelid crusting and sticking. These symptoms are typically worse in the morning.

Management includes eyelid hygiene, comprising warm compresses, eyelid massage and eyelid scrubs.¹⁹ Because blepharitis is a chronic disease, eyelid hygiene must be performed even after an acute exacerbation has resolved.

Blepharoconjunctivitis

Blepharoconjunctivitis is an ophthalmic disease that involves inflammation of both the eyelid and conjunctiva.

Symptoms typically include ocular irritation with foreign body sensation, alongside crusting of eyelids with red eyes. Symptoms are typically worse in the morning, and patients might report the eyelids being shut upon waking.²⁰

The mainstay of management is eyelid hygiene, as described above.

Nasolacrimal duct obstruction

Nasolacrimal duct obstruction is obstruction of the nasolacrimal duct. It can occur as either a congenital or secondarily acquired entity.

Common symptoms include unilateral epiphora, typically chronic. Common signs include a raised tear lake, fluorescein pooling and potentially periocular erythema secondary to tissue use.

Molluscum contagiosum

Molluscum contagiosum (MC) is a DNA virus that infects the skin and mucous membranes, resulting in characteristic nodules. It can present as ocular MC secondary to eyelid nodules, leading to a chronic conjunctivitis via a hypersensitivity reaction. The lesions are typically firm, rounded papules 2–5 mm in size, pink or skin coloured with a shiny umbilicated surface. They can occur as clusters or individually.

Common symptoms include typically unilateral symptoms including erythema, tearing and irritation. This might also be associated with pruritis and irritation.

Diagnosis is based on curetting the nodule and sending for pathology, alongside the classical findings.

Microbial keratitis

MK is a serious bacterial infection of the cornea that can be sight threatening.

Risk factors include anything that can disrupt the integrity of the corneal epithelium, the most common being contact lens wear (particularly overnight wear or inadequate disinfection). Other risk factors include trauma (especially organic material) and changes in the corneal surface (eg dry eye, exposure).

Diagnosis is based on a fluorescein assessment showing a corneal ulcer, with surrounding infiltrate (white or opaque appearance within the corneal stroma) and potentially cells within the anterior chamber.

Treatment should include same-day referral to an ophthalmologist for ongoing management.

HSV keratitis

HSV keratitis is a common cause of red eye and can cause blepharoconjunctivitis. It is typically unilateral, but can occur bilaterally.

Risk factors include previous episodes of HSV keratitis, previous history of active HSV lesions or recent contact with an active HSV lesion.

Diagnosis is based on fluorescein assessment showing a classical dendrite (epithelial disease), but it can also present as a superficial punctate keratopathy, mild conjunctival injection, ciliary flush or corneal stromal opacification.

Treatment includes oral antiviral treatment for 10–14 days. Valaciclovir, famciclovir or acyclovir can be used.

Optometry or ophthalmology review is recommended for serial examination of the cornea, and consideration of the introduction of topical steroids.

Conclusion

Conjunctivitis is common and can be challenging to diagnose, with numerous differential diagnoses including MK, foreign body and blepharitis. A directed history and thorough exam, including visual acuity, assessment of the eyelids and eyelid margins and fluorescein testing, should be used to help discern the most likely pathology. Eye swabs can be useful in distinguishing the underlying aetiology, thereby guiding treatment. It is important to ensure patients understand the likely progression of the disease and that further advice and review by an optometrist or ophthalmologist is sought if there are any red flags or concerns.

Key points

- Conjunctivitis is typically caused by viruses in an adult population and bacteria in children.
- The disease course for conjunctivitis is typically self-limiting, but can last up to three weeks (aside from chlamydial causes).
- If in doubt, take a swab and send for viral PCR to ascertain the cause.
- If the conjunctivitis does not resolve within three weeks, consider sending a swab for chlamydial serology, because this is a potential cause.

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