

# Conjunctivitis

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Conjunctivitis is a common cause of eye redness and subsequently a common complaint in the emergency department, urgent care, and primary care clinics. It can affect people of any age, demographic or socioeconomic status. Although usually self-limiting and rarely resulting in vision loss, when assessing for conjunctivitis, it is essential to rule out other sight-threatening causes of red-eye.

**The conjunctiva** is the transparent, lubricating mucous membrane covering the outer surface of the eye. It is composed of two parts, the “bulbar conjunctiva” which covers the globe and the “tarsal conjunctiva” which lines the eyelid's inner surface.

Conjunctivitis refers to the inflammation or infection of the conjunctiva. It can be acute or chronic and infectious or non-infectious. **Acute conjunctivitis** refers to symptom duration 3 to 4 weeks from presentation (usually only lasting 1 to 2 weeks) whereas **chronic conjunctivitis** is defined as lasting more than 4 weeks.

## **Etiology**

Conjunctivitis is the most prevalent etiology of eye redness and discharge. While there are many types of conjunctivitis, viral, allergic and bacterial are the three most common.

Infectious conjunctivitis can result from bacteria, viruses, fungi, and parasites. However, 80% of acute cases of conjunctivitis are viral, the most common pathogen being *Adenovirus*. *Adenoviruses* are responsible for 65 to 90% of cases of viral conjunctivitis. Other common viral pathogens are *Herpes simplex*, *Herpes zoster*, and *Enterovirus*.

Bacterial conjunctivitis is far more common in children than adults, and the pathogens responsible for bacterial conjunctivitis vary depending on the age group. Staphylococcal species, specifically *Staphylococcal aureus*, followed by *Streptococcus pneumoniae* and *Haemophilus influenzae* are the most common cause in adults, while in children the disease is more often caused by *H. influenzae*, *S. pneumoniae*, and *Moraxella catarrhalis*. Other bacterial causes include *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and *Corynebacterium diphtheria*. *N. gonorrhoeae* is the most common cause of bacterial conjunctivitis in neonates.

Allergens, toxins and local irritants are responsible for non-infectious conjunctivitis.

## **Epidemiology**

The prevalence of conjunctivitis varies by age, sex and time of year. There is a bimodal distribution of diagnosed cases of acute conjunctivitis in the ED. The highest rates of diagnosis are among children less than 7 years of age, with the highest incidence occurring between the ages of 0 and 4 years. The secondary peak of distribution occurs at the ages of 22 years in women and 28 years in men. Overall the rates of conjunctivitis diagnosed in the ED are slightly

higher in women than in men. Seasonality is also a factor in the presentation and thus the diagnosis of conjunctivitis. Varying by age, there is a peak incidence in all presentations of conjunctivitis in children ages 0 to 4 years in March, followed by other age groups in May. A nationwide ED study found seasonality to be consistent for all geographic regions, regardless of changes in climate or weather patterns. Allergic conjunctivitis is the most frequent cause of conjunctivitis, affecting 15 to 40% of the population, and is observed most commonly in spring and summer. Bacterial conjunctivitis rates are highest from December to April.

## **Pathophysiology**

Conjunctivitis results from inflammation of the conjunctiva. The cause of this inflammation can be due to infectious pathogens or non-infectious irritants. The result of this irritation or infection is injection or dilation of the conjunctival vessels; this results in the classic redness or hyperemia and edema of the conjunctiva. The entire conjunctiva is involved, and there is often discharge as well. The quality of discharge varies depending on the causative agent.

## **History, Physical Examination and Diagnosis**

History and physical examination are, of course, essential in the diagnosis of conjunctivitis, and in determining the cause and therefore treatment of the condition.

- Bacterial: symptoms of redness and foreign body sensation, morning matting of the eyes, white-yellow purulent or mucopurulent discharge, conjunctival papillae, infrequently preauricular lymphadenopathy.
- Viral: symptoms of itching and tearing, history of recent upper respiratory tract infection, watery discharge, inferior palpebral conjunctival follicles, tender preauricular lymphadenopathy.
- Allergic: symptoms of itching or burning, history of allergies/atopy, watery discharge, edematous eyelids, conjunctival papillae, no preauricular lymphadenopathy.

## **Treatment/Management**

Treatment of both viral and bacterial conjunctivitis should include patient education to decrease the rate of transmission. Viral and bacterial conjunctivitis can spread by direct contact and have high transmission rates. Patients should be instructed to avoid touching their eyes, shaking hands, sharing personal items such as cosmetics or towels and avoidance of swimming pools while infected.

**Bacterial conjunctivitis**, while typically self-limiting, can be treated to help reduce the duration of symptoms. No significant difference in outcomes has been observed in trials comparing different types of ophthalmic antibiotic drops. While ointments typically last longer than drops, they tend to interfere with vision. Initial treatment for acute, non-severe bacterial conjunctivitis varies depending on the antimicrobial agent, but generally is administered to the affected eye from every two to every 6 hours for 5 to 7 days. Antibiotic options are available as liquid solutions and topical ointments. Liquid suspension/solutions include **polymyxin b/trimethoprim, ciprofloxacin, ofloxacin, levofloxacin, moxifloxacin, gatifloxacin or azithromycin**, while **bacitracin, erythromycin or ciprofloxacin** can be administered as an

ointment. **Fluoroquinolones** should be prescribed for contact lens wearers to provide empiric coverage for *Pseudomonas*.

The recommended treatment for gonococcal conjunctivitis is ceftriaxone 1gm IM, and it is recommended to treat for concurrent chlamydial infection with 1gm azithromycin PO as well. The neonatal dosing for gonococcal conjunctivitis is 25 to 50mg/kg ceftriaxone IV/IM with a max dose of 125mg, with 20mg/kg azithromycin PO once daily for three days.

**Viral conjunctivitis** due to adenoviruses is self-limiting, and treatment should target symptomatic relief with cold compresses and artificial tears.

Herpes simplex keratitis should receive antiviral therapy. Mild infections can have treatment with **trifluridine** 1% drops every 2 hours or 8 to 9 times a day for 10 to 14 days, topical **ganciclovir** 0.15% gel 1 drop five times a day until epithelial heals and then three times daily for one week, or oral acyclovir 400mg PO 5 times a day for 7 to 10 days to limit epithelial toxicity. Patients should have a follow-up with ophthalmologists within 2 to 5 days to monitor for complications.

Treatment of herpes zoster conjunctivitis includes a combination of oral antivirals and topical steroids; however, steroids should only be part of therapy in consultation with ophthalmology. Antiviral doses differ from those used for herpes simplex and consist of oral acyclovir 800mg five times a day, oral famciclovir 500mg three times a day, or oral valacyclovir 1g three times a day, each for 7 to 10 days.

Topical corticosteroids are not recommended for cases of bacterial or viral conjunctivitis, except for herpes zoster, as they can prolong the disease or potentiate the infection, resulting in complications including corneal damage and blindness.

Lastly, the treatment for **allergic conjunctivitis** consists of allergen avoidance, artificial tears, cold compresses, and a wide range of topical agents. Topical agents include topical **antihistamines** alone or in combination with **vasoconstrictors**, topical **mast cell inhibitors** and topical **glucocorticoids** for refractory symptoms. Oral antihistamines can also be used in moderate to severe cases of allergic conjunctivitis.

## References

Ryder EC, Benson S. Conjunctivitis. [Updated 2019 Nov 13]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK541034/>