



Review Article

Eye Conjunctivitis

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ABSTRACT

Around the world, conjunctivitis is a prevalent ailment seen in ophthalmology clinics. Alarming indicators of more serious intraocular disorders, such as significant pain, impaired vision, and painful pupillary reaction, must be taken into consideration when managing suspected cases of conjunctivitis. Patients with unusual results and a chronic course should also have a comprehensive physical examination as well as a complete medical and ophthalmic history. Conjunctival involvement in a systemic disease may be detected by concurrent physical exam findings and pertinent history. Conjunctivitis caused by viruses is still the most common cause of the condition overall. Although it is less common, bacterial conjunctivitis is the second most common cause of infectious conjunctivitis. About 50% of people experience allergic conjunctivitis, which is characterized by itching, mucoid discharge, chemosis, and edema of the eyelids. When patients with conjunctival irritation and discharge use preservative-containing eye drops over an extended period of time, toxic conjunctivitis is likely the underlying cause. Timely diagnosis, adequate classification of the various etiologist, and suitable treatment are all important components of effective conjunctivitis care.

INTRODUCTION

In addition to blood vessel engorgement, ocular discharge, and pain, conjunctivitis is characterized by inflammation and edema of the conjunctival tissue. Conjunctivitis affects a large number of people globally and is a common cause of office visits to general medical and ophthalmology clinics. Non-ophthalmologists, such as internists and family doctors, are said to have diagnosed more than 80% of all acute cases of conjunctivitis. According to reports, almost 60% of patients with

acute conjunctivitis are prescribed antibiotic eye drops, and the majority of these prescriptions are written by doctors who are not ophthalmologists. For instance, 36% of patients who saw an ophthalmologist at the emergency room received antibiotic eye drops, compared to 68% of those who saw a doctor there. It's interesting to note that individuals with higher socioeconomic status had a higher likelihood of being prescribed medicine for conjunctivitis.(1)

History and clinical examination

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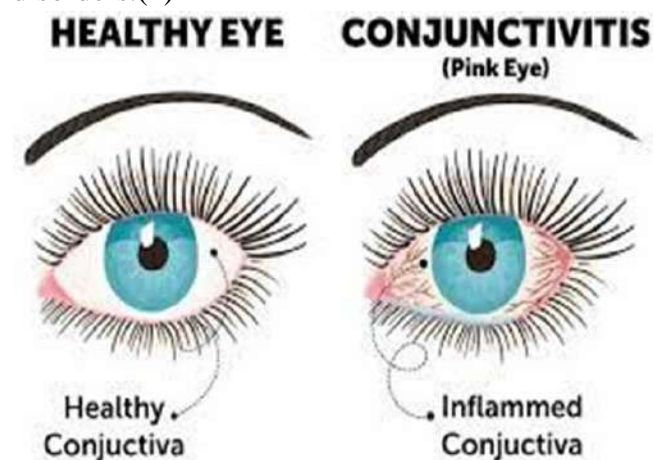
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How to diagnose conjunctivitis:

Conjunctival injection, sometimes known as "red eye," is a common presentation for a number of ocular conditions and may be the reason for up to 1% of primary care visits. Whether or not they are ophthalmologists, clinicians need to be aware that "red eye" can be a symptom of more benign conditions that only affect the conjunctiva, such as conjunctivitis or subconjunctival hemorrhage, or it can be the secondary symptom of more serious conditions like uveitis, keratitis, or scleritis. It was once thought that vision abnormalities, incapacitating pain, and photophobia were indicative of more serious ophthalmic disorders.(2)



How to distinguish bacterial conjunctivitis from viral conjunctivitis: Making a diagnosis of conjunctivitis based only on the symptoms and signs that are present can frequently lead to an incorrect conclusion. In one study, the accuracy rate of centers with ocular surface disease expertise in correctly diagnosing adenoviral conjunctivitis was only 48%.(3)

How to distinguish infectious conjunctivitis from non-infectious conjunctivitis :

When a patient presents with conjunctivitis, getting their medical history is essential to making the right diagnosis. What should be included in a focused ocular history is as follows: symptoms' beginning and duration; laterality; visual impairment; itching; history of wearing contact

lenses; presence of other travelers with conditions like recent upper respiratory infections, sinusitis, and lymphadenopathy; prior bouts of conjunctivitis; systemic allergies and medication; and history of chemical agent exposure. Eye discharge, conjunctival injection, presence of red eye(s), lashes stuck together in the morning, grittiness of the eye(s), eyelid or conjunctival edema, and history of contact with conjunctivitis sufferers are some of the clinical signs and symptoms that are used to help diagnose infectious conjunctivitis.(4)It's possible that allergic conjunctivitis is underdiagnosed and treated. There is no discernible corneal involvement, and the symptoms include itching, chemosis, and redness.(5) Conjunctival swelling frequently exceeds the range of conjunctival hyperemia. The major observation in vernal keratoconjunctivitis (VKC) is the presence of extremely painful itching along with giant papillae in the superior tarsal conjunctiva.(6)

How to distinguish bacterial conjunctivitis from viral conjunctivitis:

It's common to diagnose conjunctivitis incorrectly when attempting to infer the underlying cause from the symptoms and signs that are currently present. In one study, the accuracy rate of centers with ocular surface disease expertise in correctly diagnosing adenoviral conjunctivitis was only 48%.(3) In the past, it was thought that there were certain correlations between the etiology of conjunctivitis and the clinical history. These concepts were widely discussed in textbooks and were also applied in the patient selection process for numerous clinical trials. For instance, the major ophthalmology text books (Krachmer, Duane, and Kanski, for example) state that involvement in one eye followed by involvement in the other within 24 to 48 hours is suggestive of bacterial infection, whereas if the infection in the second eye develops after 48 hours and is accompanied by an enlarged periauricular lymph

node, a viral etiology should be taken into consideration. The same textbooks state that follicular conjunctival reaction is more likely to suggest a viral etiology, whereas papillary conjunctival reaction or pseudomembranous conjunctivitis strongly suggests a bacterial origin for conjunctivitis. There are numerous other hypothesized but weakly supported clinical correlations between the etiology of conjunctivitis and symptoms. For instance, the link between bacterial conjunctivitis and the absence of itching has been investigated recently. Other correlations that were formerly believed to be accurate but now lack supporting data include: recent upper respiratory tract infection and lymphadenopathy in support of viral conjunctivitis; sinusitis, fever, malaise, and fatigue in favor of bacterial conjunctivitis; and a history of conjunctivitis with bilateral ocular involvement in support of viral and allergic but not bacterial conjunctivitis. A 2003 meta-analysis was unable to locate any clinical research linking the symptoms and indicators of conjunctivitis to its underlying cause.(7)

How do laboratory findings help us?

When treating conjunctivitis in the eyes, clinicians may take discharge samples and submit them for microbiological analysis. In cases of suspected infectious neonatal conjunctivitis, recurrent conjunctivitis, conjunctivitis resistant to treatment, conjunctivitis presenting with severe purulent discharge, and cases suspecting gonococcal or chlamydial infection, conjunctival cultures are typically reserved.(7) It is preferable to take discharge swabs prior to starting antibiotic treatment. After that, the swabs are plated in different growth media in the lab to create cultures. When diagnosing fungus on Sabouraud agar plates, patients with immunocompromised or chronic blepharitis should use this technique. Additionally beneficial may be anaerobic culture plates, particularly for patients with a history of

trauma or prior surgery.(8) Antimicrobial therapy should be stopped 48 hours before obtaining cultures if it has already been initiated. Coagulase-negative staphylococci were the most prevalent organisms in a five-year review of 138 pediatric ocular surface infections, followed by *Pseudomonas aeruginosa* and *Staphylococcus aureus*.(9) In the diagnosis of viral infections, nucleic acid amplification techniques—which call for specialized swabs—may be employed. Numerous polymerase chain reaction (PCR) tests are available for virus detection. While adenoviruses can be detected with 89% sensitivity and up to 94% specificity in primary studies from in-office rapid antigen testing, the results of more recent studies indicate a high specificity but only moderate sensitivity ranging from 39.5% to 50%.(10)

Viral conjunctivitis:

The most frequent cause of infectious conjunctivitis overall is viral conjunctivitis, which typically develops as a result of adenovirus inoculation of the ocular surface. Herpes simplex virus (HSV), varicella zoster virus (VZV), and enterovirus are among the less common viruses that may be the underlying cause of viral conjunctivitis. These viruses have all been the focus of research.(11)

Adenoviral conjunctivitis:

Adenoviruses are the primary cause of infectious conjunctivitis globally, accounting for up to 90% of cases of viral conjunctivitis. Human adenoviruses (HAdV) have been the subject of recent advances in genome sequencing, which have revealed over 72 distinct HAdV genotypes divided into seven species (HAdV-A through HAdV-G), with the HAdV-D species having the greatest number of members and the strongest correlation with viral conjunctivitis.(12) Fever, pharyngitis, periauricular lymphadenopathy, and acute follicular conjunctivitis are the usual sympto

of this illness. Pro-inflammatory cytokines and the conjunctival vasculature interact to cause edema, hyperemia, and petechial hemorrhages of the conjunctiva, among other ocular surface findings.(13) According to some reports, adenovirus conjunctivitis can spread up to 50% of the time, making it extremely contagious. The virus can spread through contaminated hands, medical equipment, contaminated pool water, or shared personal goods. In one study, up to 46% of people with viral conjunctivitis had positive viral cultures grown from their hands.(14)



Figure 1. Adenoviral conjunctivitis presenting as bilateral watery eyes.

Owing to the highly contagious nature of viral conjunctivitis, it has been recommended that conjunctivitis patients be isolated from other patients in the healthcare provider's office, that medical instruments be meticulously disinfected, and that patients wash their hands frequently. The adenovirus takes roughly 5 to 12 days to incubate, and those who become infected can spread the illness for up to 14 days after contracting it.(15)



Figure 2. Pseudo membrane formation in a patient with adenoviral conjunctivitis.

Herpetic conjunctivitis:

An HSV infection is thought to be the cause of 1.3%–4.8% of all cases of acute conjunctivitis. HSV frequently results in a unilateral follicular conjunctivitis, which may be accompanied by vesicular lesions on the skin of the eyelids and a thin, watery discharge. Topical antiviral medications such as ganciclovir, idoxuridine, vidarabine, and trifluridine are used as part of treatment. Reducing viral shedding and the likelihood of keratitis developing is the aim of the treatment. Herpes zoster infection involving the eyes, particularly when involving the first and second branches of the trigeminal nerve, can result in eyelid lesions in 45.8% of cases, uveitis in 38.2% of cases, conjunctivitis in 41.1% of cases, and corneal lesions like SEIs, pseudodendrites, and nummular keratitis in another 19.1% of cases.(16)

Acute hemorrhagic conjunctivitis:

One particularly contagious type of viral conjunctivitis is acute hemorrhagic conjunctivitis (AHC). The symptoms include a feeling of a foreign body, excessive tears, edema around the eyes, dilatation of the conjunctival vessels, chemosis, and subconjunctival hemorrhage. A small percentage of patients may experience leg pain, exhaustion, and fever. The illness is self-limiting; during the first week of infection, the symptoms gradually get better and go away entirely in 10 to 14 days.(16) By promoting frequent handwashing and limiting contact with the affected individuals, medical intervention primarily aims to control large outbreaks and implement preventative measures to protect vulnerable groups, including children, the elderly, pregnant women, and immunocompromised individuals.(17)

Miscellaneous viral conjunctivitis:

Molluscum contagiosum (MC) infection is typified by a number of implicated and popular skin lesions brought on by the Pox-2 virus. Sexual

activity and skin-to-skin contact are the primary modes of transmission. Subepithelial pannus, punctate keratopathy, and chronic follicular conjunctival reaction are caused by the viral proteins that shed from the eyelid lesions into the tear film. Primary MC lesions in the conjunctiva are uncommon.(18)

Bacterial conjunctivitis:

Although bacterial conjunctivitis is less common in adults than viral conjunctivitis, it is more common in children. Either direct contact with an infected person or an aberrant proliferation of the natural conjunctival flora can cause bacterial conjunctivitis. Common routes of transmission include contaminated fingers, oculogenital spread, and contaminated fomites. Additionally, there is a higher chance of developing bacterial conjunctivitis in cases of impaired tear production, disruption of the natural epithelial barrier, abnormalities of adnexal structures, trauma, and immunosuppressive status.(19) A number of studies on bacterial conjunctivitis have shown that 90% of those afflicted may experience sticky eyelids and itching; these results are followed by less common signs and symptoms like purulent secretion and burning in the eyes Upper respiratory tract infections and acute otitis media may be linked to H. influenza conjunctivitis. Serious complications are incredibly rare and spontaneous cure occurs in over 60% of cases in one to two weeks [83]. However, a patient is more likely to develop keratitis if there is a high population of bacteria on their conjunctiva, especially if they have conditions like dry eye that are linked to orneal epithelial defects.(20)

TREATMENT:

The cornerstone of treatment for many types of allergies, including allergic conjunctivitis, is avoiding the allergens. Artificial tears act as a barrier, dilution of different allergens, and cleansing of the ocular surface from numerous inflammatory mediators. Antihistamines, mast cell

stabilizers, and lubricating eye drops are among the treatments for allergic conjunctivitis. Numerous research studies have shown that topical antihistamines and mast cell stabilizers are more effective than placebo in reducing allergic conjunctivitis symptoms. Moreover, antihistamines are more helpful than mast cell stabilizers in providing temporary relief.(21) In recent years, a number of eye drop preparations including olopatadine, ketotifen, azelastine, and epinastine with dual action (antihistamine and mast cell stabilizing effects) have been brought to market. These substances have the ability to stabilize mast-cell membranes, concurrently produce histamine receptor antagonist effects, Mast cell stabilizers should ideally be given prior to the antigen exposure because they need a few weeks to fully load. Oral antihistamines are frequently prescribed to patients with allergic conjunctivitis in order to relieve their ocular symptoms. Since second generation antihistamines have fewer harmful systemic side effects, they are recommended.(22)

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