

## A review Article on: Conjunctivitis

Author: miss. Dhage Nikita

Guide: Proff. Mr. AbhijeetShete

Principle mam: Dr.megha salve

*Institute name: Shivajirao pawar college of pharmacy, pachegaon*

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### ABSTRACT –

Conjunctivitis is a common problem in children and can be broadly divided into infectious and non-infectious etiologies. Bacterial conjunctivitis accounts for the majority of cases in children and often presents with purulent discharge and clouding of the eyelids. In simple cases, treatment favors an individual approach using antibiotics, as these can shorten the duration of the symptoms, but are not without risks. Another infectious cause is viral conjunctivitis, which is primarily caused by adenovirus and presents with Burning sandy sensation and watery discharge. Conjunctivitis is a common problem. Viral conjunctivitis is the most common cause of infectious conjunctivitis And usually does not require treatment. Signs and symptoms at presentation vary. Bacterial conjunctivitis is the second most common cause of infectious conjunctivitis, and Of the simplest cases resolve within 1 to 2 weeks

Allergic conjunctivitis occurs in almost half of the population and is manifested by itching, mucus secretion, chemosis, and swelling of the eyelids. Long-term use of eye drops containing preservatives in a patient with conjunctival irritation and discharge suggests toxic conjunctivitis as the cause. Effective treatment of conjunctivitis includes timely diagnosis, appropriate differentiation of various etiologies, and appropriate treatment.

Other causes of conjunctivitis include foreign bodies and non-allergic environmental influences. Contact lens wearers should always be treated for bacterial conjunctivitis and checked for corneal ulcers. Effective treatment of conjunctivitis includes timely diagnosis, appropriate differentiation of various etiologies, and appropriate treatment.

**Keywords** – conjunctivitis, chemosis, etiologies, epidemiology

### I. INTRODUCTION -

The conjunctiva is a thin, translucent membrane that lines the front of the sclera and the

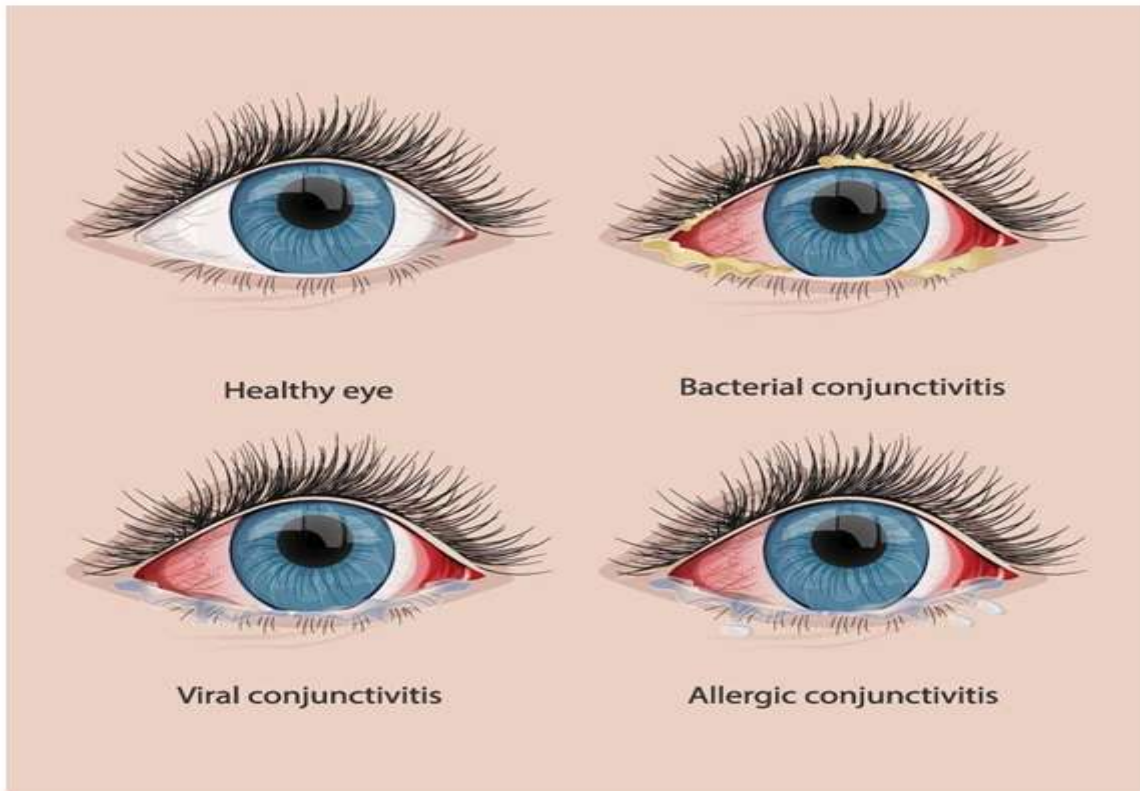
inside of the eyelids. It consists of 2, Parts, bulbar and lid. The bulbous part begins at the edge of the cornea and covers the visible part of the sclera; The palpebral part Defines the inner surface of the eyelids (Fig. 1). Inflammation or infection of the conjunctiva is called conjunctivitis and is characterized by dilation of the conjunctival vessels, resulting in hyperemia and swelling of the conjunctiva, usually accompanied by discharge. 1, Conjunctivitis affects many people and represents a financial and economic challenge. Social contributions. Acute conjunctivitis affects an estimated 6 million, People per year in the United States. 2 The cost of treating bacterial conjunctivitis alone is estimated at \$377,857, Million per year. 3 Many state health departments in the United States Regardless of the cause of conjunctivitis, students must use topical antibiotic eye drops before returning to school. [1]

The conjunctiva is the outermost layer of the eye and covers both the sclera and the inside of the eyelids. Conjunctivitis or commonly known as “pink eye” can be caused by many causes including viral, bacterial and fungal infections as well as other causes such as allergies and chemical trauma (Al-Ghamdi et al., 2020; Mohamed et al., 2018 ; Embaby et al., 2018; Narayana et al., 2020). According to a study conducted in Saudi Arabia, Viral infections have the highest overall incidence among Etiologies, with the majority caused by Adenoviruses (67.1%) (Tabbara et al., 2010). In addition, another study found Almost similar cases. Results: 62% of Cases in Pennsylvania, USA, are due to adenoviruses. (Sambursky et al., 2007) Conjunctivitis is considered a common disease in practice And accounts for 1% of all primary care visits In the United States. (Shields and Sloane, 1991) The purpose of this Review is to collect data on conjunctivitis; particularly on its etiology, diagnosis and treatment. [2]

Conjunctivitis, commonly known as “pink eye,” refers to inflammation or infection of the conjunctiva. The conjunctiva is a thin mucous

membrane that lines the inside of the eyelids and the surface of the eyeball up to the limbus, where the sclera and cornea are located. Is divided into the following two parts: the bulbar part, which covers the globe, and the tarsal part, which covers

the eyelids. It is generally transparent; However, when it becomes infected it can turn pink or red, hence the colloquial term “pink eye”. The severity of conjunctivitis .[3]



#### History –

#### How to diagnose conjunctivitis -

Conjunctivitis, or “red eye,” is a common manifestation of many eye diseases and accounts for up to 1% of all primary care visits.[6] Physicians, whether ophthalmologists or not, should be aware that red eyes can be a symptom of serious eye diseases such as uveitis, keratitis, or scleritis, or a secondary consequence of more benign diseases limited only to the conjunctival

tissue (e.g., conjunctivitis or hemorrhage). Subconjunctival. Traditionally, blurred vision, disabling pain and photophobia were considered the most dangerous eye diseases., in a recent meta-analysis anisocoria and mild photophobia were significantly associated with “severe eye disease”: the presence of these two symptoms allowed the detection of 59% of cases of “severe eye disease.” .. serious eye problems”; , including anterior uveitis and keratitis. (4)

**Table 1.** Guideline to help differentiate the major etiologies in conjunctivitis

Clinical history and exam findings	Most probable etiologies
<b>Alarming signs and symptoms</b>	
Decreased vision, severe pain, painful pupillary reaction, anisocoria, orbital signs	Uveitis, scleritis, keratitis, glaucoma, orbital, or parasellar pathology
<b>Chronicity</b>	
Sudden onset, lasting less than four weeks	Infectious conjunctivitis, allergic conjunctivitis, acute systemic reactions (SJS/TEN)
Insidious onset, chronic course	Conjunctivitis associated with systemic diseases, toxic conjunctivitis, allergic conjunctivitis
Recurrent course	Allergic conjunctivitis, conjunctivitis associated with systemic diseases
<b>Associated symptoms</b>	
Skin lesions, arthropathy, genito-perineal involvement, oropharyngeal lesions	Conjunctivitis associated with systemic diseases, infectious diseases
<b>Drug history</b>	
Long-term eye drop usage	Toxic conjunctivitis, allergic conjunctivitis
Recent initiation of a systemic medication	Acute systemic reactions (SJS/TEN)

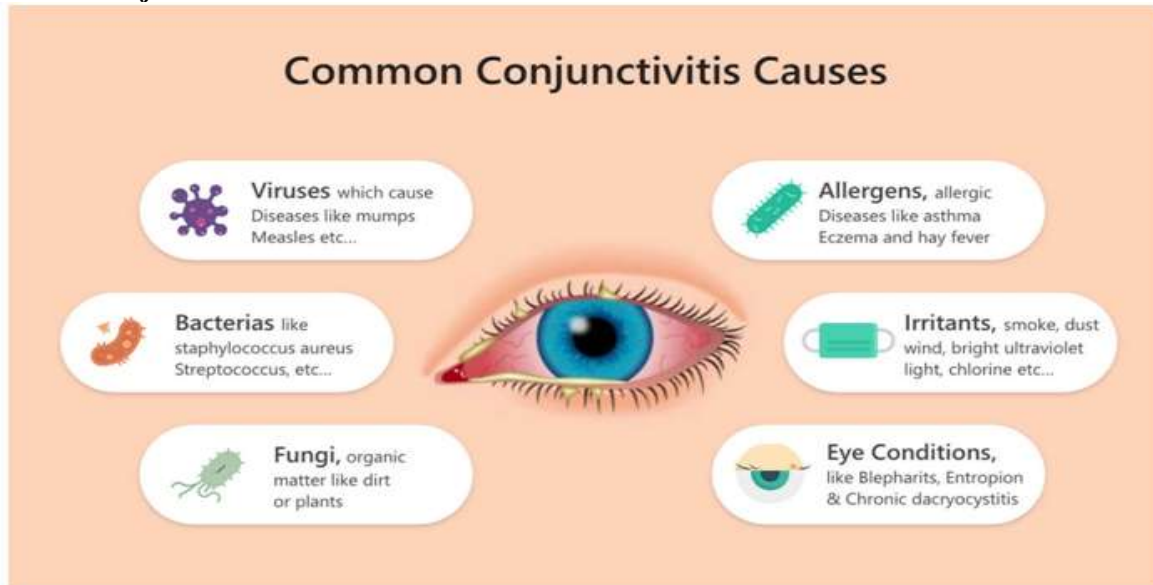
SJS, Stevens-Johnson syndrome; TEN, toxic epidermal necrolysis

**Etiology –**

Conjunctivitis is a more common cause of eye redness and eye discharge. The etiology of conjunctivitis can be infectious or non-infectious in nature. The most common causes of conjunctivitis are viral and bacterial conjunctivitis, and among non-infectious diseases, allergic and toxin-related conjunctivitis are the most common. The presence of bacteria, fungi, viruses and parasites can cause infectious conjunctivitis. However, 80% of acute conjunctivitis episodes are caused by viruses, and Of them are the most common triggers. Adenoviruses are responsible for 65–90% of cases of viral conjunctivitis. Other common viral pathogens include herpes zoster, herpes simplex and enteroviruses. Children are Times more likely

to suffer from bacterial conjunctivitis than adults, and the microbes that cause it vary by age group. Staphylococcus species, particularly Staphylococcus aureus, followed by Haemophilus influenza and Streptococcus pneumoniae, are the most common causes in adults. Although the disease in children is most often caused by H.influenzae, S. pneumoniae and Moraxella catarrhalis. Other bacterial causes include N. gonorrhoeae, Corynebacterium diphtheria and Chlamydial Trachomatis. The most common cause of bacterial conjunctivitis in sexually active adults and infants is N.Gonorrhea. Allergens, local irritants and toxins are responsible for non-infectious conjunctivitis.(5)

**Causes of Conjunctivitis**



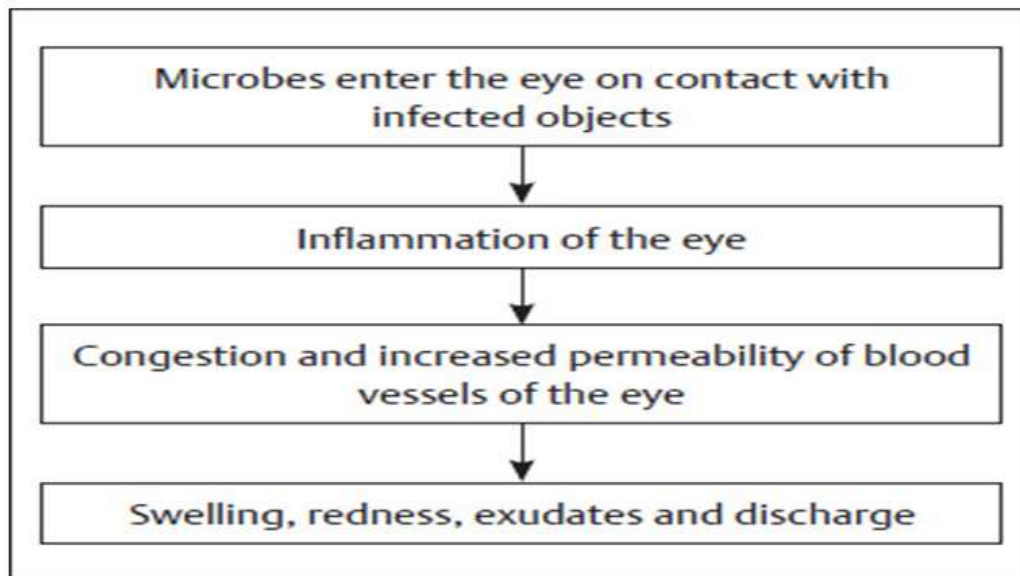
**Pathophysiology – Infective Conjunctivitis –**

Infectious conjunctivitis is an infection of the conjunctiva caused by viruses or bacteria such as adenovirus, Staphylococcus aureus, Streptococcus pneumoniae and Haemophilus influenzae. Any alteration in host defenses or normal ocular flora can lead to clinical infections and conjunctivitis.

A change in normal flora can occur through:

- External pollution
- Wearing contact lenses

- Swimming
- Infectious conjunctivitis is usually transmitted through:
- Direct contact with the ocular discharge of an infected person due to coughing, Sneezing or runny nose
  - Contact with fingers, hands, or objects of an infected person (eye makeup applicators, towels, common eye medications)
  - Adjacent sites of infection (eye rubbing)(6)



## Types of Conjunctivitis –

### 1. Viral Conjunctivitis–

Viral conjunctivitis is the most common form of conjunctivitis, accounting for approximately 80% of cases. It is caused by a virus like a cold. It can affect either eye and is spread through contact with the secretions of an infected person, coughing, or sneezing.

“Any virus that causes a cold or flu can also enter the eye and cause eye inflammation,” says Arthur Lavin, M.D.FAAP, pediatrician at Akron Children’s Hospital in Beachwood, Ohio.

According to Dr. Lavin:

Adenovirus (a virus that usually causes colds)

Influenza

Respiratory Syncytial Virus (RSV)

Rhinovirus (another virus that can cause colds)

Children are most susceptible to viral conjunctivitis, which occurs in schools and kindergartens is very contagious. “Because children catch colds more often, they are more likely to get an eye infection,” adds Dr. Lavin added.(7)



### 2. Allergic Conjunctivitis –

Allergic reaction to some irritants such as pollen, animal dander and dust mites. It usually affects both eyes and is not as contagious as other forms. The secretions associated with allergic conjunctivitis are usually clear and watery, in contrast to the thick secretions associated with bacterial conjunctivitis.

Because allergens are more common in spring and summer, allergic conjunctivitis is more common during this time. This form can occur as an immediate reaction to the allergen or can appear hours or days later. The best way to prevent and treat this type of pink eye is to avoid the allergens that cause it.(8).



### 3. Bacterial Conjunctivitis –

Patients with bacterial conjunctivitis often complain of redness, tearing, and discharge from one or both eyes. Clinicians should ask patients about the duration of symptoms, as disease progression can be divided into hyperacute, acute (less than 3–4 weeks), and chronic (more than four weeks). Associated pain, pruritus, vision loss, and photophobia also contribute to clinical decision making. A complete medical history should also include history of trauma, previous similar episodes, any previous treatments, contact lens use, immune status, and sexual history. Any middle ear problems should also be clarified, as children with bacterial conjunctivitis can also develop an accompanying middle ear infection.(9).



### 4. Herpes Conjunctivitis –

Herpes simplex (HSV) virus is ubiquitous and its associated conjunctivitis is often difficult to distinguish from adenovirus-related conjunctivitis

and may be present in 1–5 % of all conjunctivitis cases. Clinical diagnosis becomes challenging without the presence of skin lesions, highlighting the importance of a thorough history, which may elicit prior evidence of suggestive cold sores. Unilateral presentation is more common and discharge is thin and watery. Blepharconjunctivitis is the Most common single form of HSV in children, accounting for 41.5 % of HSV-infected patients in one study. The goal of treating HSV conjunctivitis is to prevent infection of the cornea. Topical or oral treatment is recommended. Ganciclovir gel 0.15% 3 to 5 times daily and trifluridine 1% 5 to 9 times daily are topical options; Ganciclovir is preferred due to its lower corneal toxicity compared to trifluridine. Oral acyclovir is often prescribed at a dose of 200-400 mg five times daily, but valacyclovir or famciclovir may also be used.(14)

#### Symptoms of Conjunctivitis –

- Pink or red colour of the whites of the eyes
- Swelling of the conjunctiva (the thin layer that covers the white part of the eye and the inside of the eyelid) and/or the eyelids
- Increased tear production
- Feeling of something foreign in the eyes or urge to rub them
- Itching, irritation and/or burning
- Discharge (pus or mucus)
- Hardening of the eyelids or eyelashes, especially in the morning
- Uncomfortable and/or unsuitable contact lenses that are out of place in the eye.(10)

#### Diagnosis –

Ophthalmologists usually assess cases of acute infectious conjunctivitis during visits to specialists. Treatment of patients with infectious conjunctivitis in primary care is suboptimal due to the underestimation of the incidence of viral conjunctivitis and the high prescription of antibiotics (~80%) in infectious conjunctivitis, although guidelines discourage the use of antibiotics in minor cases and self-pathological conditions. is a measure of the presumptive diagnosis of bacterial conjunctivitis, but the clinical accuracy rate of diagnosing viral conjunctivitis may be <50%. Observational results show that upon laboratory confirmation, pathogenic bacteria are isolated in only 30-50% of suspected cases.

Accurate diagnosis of acute infectious conjunctivitis presents several challenges. First,

there is clinical uncertainty between the acute viral and bacterial forms and the allergic forms, which can complicate the diagnosis.(11)

#### Treatment -

##### Antibiotics

They are often used to treat or prevent a bacterial eye infection

. They are more effective against some bacteria, and sometimes an infection that cannot be treated with one drug can be treated with another. The most commonly used antibiotics

Are gentamicin, sulfacetamide, erythromycin, ciprofloxacin, tobramycin and ofloxacin 12 .

##### Traditional plants for treating eye diseases

In the medical system, the challenge is to treat Eye diseases with chemical drugs without side effects. However, nowadays it is no longer very effective with the help of medicinal plants. And therefore; Due to their effectiveness, rare side effects and low cost, efforts have been made to identify New medicinal plants from various sources. Around ,200 plants have been identified worldwide to help treat eye diseases and several Plant species have been listed in traditional Indian medicine for their ophthalmic properties.

In the Ayurvedic system of medicine, there are many plants in ancient Indian books such as CharakSamhita, SushrutSamhita, RasTarang, Bhavprakasha, NayanDrastam and Astanhriday, Of which are used for both simple and complex eye diseases. In Ayurveda (Indian System of medicine), various eye disorders and diseases like Abhishyand(conjunctivitis), Adhimanth (glaucoma), Timir (cataract), etc. are treated. Are described in detail. Their etiology and treatment methods are also described. There are about Reports about which medicinal plants are used to treat eye diseases. About Information such as common name, scientific name, Family, part used and references to plants used to treat eye diseases are recorded.(11)

##### Clinical examination -

An initial diagnosis is necessary to rule out a potentially serious cause of acute red eyes. Historical features that should be investigated include pain or photophobia, which may be symptoms of bacterial keratitis, anterior uveitis, or acute angle-closure glaucoma. Associated symptoms such as an upper respiratory tract infection or known contact with other people with this disease indicate a viral form.

Conjunctivitis. The patient's ocular trauma should be considered as a possible alternative cause of inflammation. Corneal abrasion caused by the presence of a foreign body or by exposure to sunlight or ultraviolet rays can cause redness in the eyes. Red, painful and watery eyes caused by foreign bodies in the cornea or can resemble acute and chronic conjunctivitis. The presence of a foreign body can be detected through a detailed interview and biomicroscopic examination. Contact lens wearers are at high risk of corneal damage and bacterial keratitis; Therefore, these individuals should be referred to an ophthalmologist. Some symptoms of acute infectious conjunctivitis mimic dry eye, such as: B. Hyperemia, Roughness and burning. Adherence to triage guidelines. (12)

#### **Histopathological findings –**

The cellular infiltrate in the conjunctiva in CCID is similar to that in conjunctival MMP. The subepithelial infiltrate consists of active fibroblasts, lymphocytes, plasma cells and mast cells. An increased population of conjunctival macrophages with MMPs causes a fibrogenic process as a result of cytokines such as transforming growth factor beta, platelet-derived growth factor (PDGF), basic fibroblast growth factor (bFGF), and tumor necrosis alpha (TNFα).

Histopathological examination of conjunctival biopsies from eight patients in the current case series revealed a chronic band-like subepithelial inflammatory infiltrate consisting of lymphocytes and plasma cells. Conjunctival squamous metaplasia with goblet cell loss was observed in all cases, and conjunctival keratinization was observed in 80% of samples. Blocked blood vessels and perivascular be occurred in small subepithelial vessels.

#### **Prevention of Conjunctivitis –**

Wash your hands often with soap and warm water for at least 20 seconds. Wash the especially well before and after cleaning, or no reason. Throughout the day, be careful not to touch your face unnecessarily. Applying eye drops or ointment to, your infected eye. If soap and water are not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol to clean hands.

• Never touch your eyes unnecessarily. Never touch your eyes for no reason throughout the day be careful not touch to face unnecessarily.

- Use artificial tears: Using artificial tears can help prevent dry eyes and other eye problems.
- It is recommended to follow general hygiene measures. When you return from outside, wash your hands. Try to keep your distance from family members affected by eye flu, he advised (14)
- Wear dark glasses, avoid swimming, close contact with others and touching your eyes. – He advised. Children should also miss a few days of school to prevent conjunctivitis from spreading to other classmates.
- Stay away from busy areas and do not touch common objects such as handrails or door handles.
- Strict cleaning standards must be maintained to reduce the risk of conjunctivitis transmission.

#### **Management of Conjunctivitis –**

To increase patient comfort and prevent scarring, the existing membrane or pseudomembrane can be removed using the slit lamp. These membranes can be removed using jewelry forceps or a cotton ball soaked in local anesthetic. Topical steroids can help relieve symptoms. However, they can also extend the time it takes to clear the virus. Patients should be advised not to go to work or school until symptoms resolve as they are very contagious. While using steroids, they may continue shed the virus even though there are no outward signs of an infection. Patients who have reduced vision as a result of su

epithelial infiltrates or severe conjunctival infections that cause greater discomfort than is normal should only get steroids. Unspecific disinfectant povidone-iodine is a promising therapeutic treatment for adenoviral conjunctivitis. This antiseptic solution, which is affordable and readily

Accessible, is utilized as part of the aseptic setup for ocular surgery. Although it can kill external organisms, it has no impact on intracellular organisms. Since its mode of action is not immunologically dependent, it does not cause drug resistance. Infants with adenoviral conjunctivitis who received a single dose of 2.5% povidone-iodine experienced less severe symptoms and faster recovery without adverse side effects. (15)

## **II. CONCLUSION –**

Conjunctivitis is a common complaint in the pediatric primary care office. A clinician can use diagnostic clues from the patient's history and exam to help determine the likely etiology. Approximately 1% of all patient

visits to primary care physicians are related to conjunctivitis, and the estimated cost of bacterial conjunctivitis alone is between \$377 and \$857 million per year. Reliance on signs and symptoms often leads to misdiagnosis.

Nonherpetic viral conjunctivitis, followed by bacterial conjunctivitis, is the most common cause of infectious conjunctivitis. Allergic conjunctivitis affects nearly 40% of the population, but only a small percentage of people seek medical attention. Most cases of viral conjunctivitis are caused by an adenovirus. It is not necessary to use topical antibiotics for viral conjunctivitis and they should be avoided due to the side effects of treatment. An appropriate strategy is to use a rapid antigen test to diagnose viral conjunctivitis and its inappropriate use avoid antibiotics. Tests for bacterial pathogens are isolated in only 50% of cases with suspected conjunctivitis and at least in 60% of bacterial conjunctivitis (clinically suspected or confirmed by culture resolve spontaneously without treatment. Cultures are useful in Non-responding cases. Treatment, cases of hyperacute inflammatory conjunctivitis and suspected chlamydial conjunctivitis. Treatment with topical antibiotics is generally used for contact lens wearers, for those with mucopurulent discharge and ocular pain, for Patients with suspected chlamydial and gonococcal conjunctivitis and for Patients recommended. With pre-existing superficial eye .

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