Thesis On

Survey on General Perception, Management & Treatment of Conjunctivitis

Submitted To

The Department of Pharmacy,

Faculty of Allied Health Sciences,

Daffodil International University

In the partial fulfillment of the requirements for the degree of Masters of Pharmacy

Submitted By

Student ID: 213-46-370

Batch: 13th

Department of Pharmacy

Faculty of Allied Health Sciences

Daffodil International University

---

23 December 2022

APPROVAL

This Thesis Survey on General Perception, Management & Treatment of Conjunctivitis, submitted to the Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Masters of Pharmacy and approved as to its style and contents.

BOARD OF EXAMINERS

……

Dr. Muniruddin Ahmed
Professor and Head
Department of Pharmacy
Faculty of Allied Health Sciences
Daffodil International University

…… Internal Examiner 1

…… Internal Examiner 2

…… External Examiner

DECLARATION

I, at this moment, announce that I am carrying out this Thesis study under the supervision of "Farhana Israt Jahan," Associate Professor, Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, Impartial Compliance with the Masters of Pharmacy Degree Requirement (M. Pharm). This project, I declare, is my original work. I also state that neither this project nor any part thereof has been submitted for the Masters' award or any degree elsewhere.

Supervised By:

Farhana Israt Jahan
Associate Professor
Department of Pharmacy
Faculty of Allied Health Sciences
Daffodil International University

Submitted By:

Shamia Jannat Shaima
ID: 213-46-370
Department of Pharmacy
Faculty of Allied Health Sciences
Daffodil International University

ACKNOWLEDGEMENT

I am grateful to God for the excellent health and well-being necessary to complete this work. I wish to express my sincere thanks to **Professor Dr. Muniruddin Ahamed,** Department Head of the Department of Pharmacy of Daffodil International University, for providing me with all the necessary facilities for the research.

I place on record my sincere thank you to **Professor Dr. Abu Naser Zafar Ullah**, Dean, and Faculty of Allied Health Sciences of Daffodil International University, for the continuous encouragement.

I am also grateful to my research supervisor **Farhana Israt Jahan,** Associate Professor, Department of Pharmacy, Daffodil International University. I am incredibly thankful and indebted to him for sharing his expertise and sincere and valuable guidance and encouragement extended to me.

I take this opportunity to thank all Department faculty members for their help and support. I also thank my parents for their unceasing encouragement, support, and attention. I am also grateful to my partner, who supported me through this venture.

I also place on record my sense of gratitude to one and all who directly or indirectly have put their hand in this venture.

Author

Shamia Jannat Shaima

DEDICATION

I dedicate this work to my parents and my teachers and my friends.

ABSTRACT

Around the globe, conjunctivitis is a prevalent illness seen in ophthalmology clinics. Alarming indicators of more serious intraocular disorders, including as excruciating discomfort, blurred vision, and painful pupillary reactions, must be taken into account while treating suspected instances of conjunctivitis. In addition, individuals with unusual results and a chronic course should have a comprehensive physical exam and medical and ophthalmology history taken. My aim of this study was to see the current situation of conjunctivitis and it's management. The questionnaire starts with a review and 24 questions that are right on target. There are 109 patient wares who took part in this study. This was completely physical-based cross-sectional study and the questionnaires were created in MS Word the survey was done at the National Institute of Ophthalmology & Hospital. According this survey, 56% of people were taking ophthalmic drop drugs. 33% took ophthalmic ointment. 11% took the tablet. The majority of cases is allergic conjunctivitis are due to seasonal allergies. The conjunctiva is inflamed, the little blood vesselsare more visible. Conjunctivitis affects millions of Bangladeshis at any given moment and can spread quickly from one person to another. Future research can be done to better comprehend this condition.

Keywords: Allergies, Intraocular, Conjunctivitis, Chronic

Table of content

Chapter One: Introduction

S.I	Topic	Page No
1.1	Conjunctivitis	02-03
1.2.	History	03-03
1.3.	Signs and symptoms	03-06
1.4.	Causes	07-09
1.5.	Diagnosis	09-10
1.6.	Conjunctivitis risk factors	10-13
1.7.	Types of conjunctivitis	13-13
1.7.1.	Allergic conjunctivitis	13-15
1.7.2.	Infectious Conjunctivitis	15-16
1.7.3.	Chemical conjunctivitis	16-17
1.8.	Preventive measures for Conjunctivitis	17-17
1.9.	Management	18-19
1.10.	Conjunctivitis care and treatment	19-23

Chapter Two: Literature Review

S.I	Topic	Page No
1.	Literature Review	25-27

Chapter Three: Purpose of my study

S.I	Topic	Page No
1.	Purpose of my study	29-29

Chapter Four: Methodology

S.I	Topic	Page No
1.	Methodology	31-35

Chapter Five: Result and Discussion

S.I	Topic	Page No
5.1.	Gender	37-37
5.2.	Age of patient	38-38
5.3.	Location of respondents	39-39
5.4.	Knowledge about conjunctivitis of respondents	40-40
5.5.	Duration of suffering conjunctivitis	41-41
5.6.	Follow-up doctor	42-42
5.7.	Sensitive to sunlight of conjunctivitis patient	43-43
5.8.	Vision problem of patients	44-44
5.9.	Taking Regular Medication	45-45
5.10.	Types of drugs used for conjunctivitis	46-46
5.11.	Conjunctivitis effects on Lifestyle	47-47

Chapter Six: Conclusion

S.I	Topic	Page No
6.	Conclusion	49-49

Chapter Seven: Reference

S.I	Topic	Page No
7.	Reference	

List Of Figures-

S.I	Figure name	Page No
1.	Conjunctivitis	02-02
2.	Viral Conjunctivitis	04-04
3.	Streptococcus	05-05
4.	Enterovirus 70	07-07
5.	Streptococcus pneumonia	08-08
6.	Allergic conjunctivitis	13-13
7.	Antibiotics	20-20
8.	Chloramphenicol	21-21
9.	Fusidic acid	22-22
10.	Gender	37-37
11.	Age	38-38
12.	Location	39-39
13.	Knowledge	40-40
14.	Duration	41-41
15.	Regular follow-up doctor	42-42
16.	Sensitive to sunlight	43-43
17.	Vision problem	44-44
18.	Medication	45-45
19.	Types of drugs	46-46
20.	Lifestyle	47-47

Introduction

1.1. Conjunctivitis

Conjunctivitis, commonly referred to as pink eye, is an inflammation that affects the outermost layer of the white area of the eye as well as the inner surface of the eyelid. The symptoms of conjunctivitis include redness, discharge, and itching. It gives the appearance of the eye as pink or reddish. You may experience discomfort in the form of pain, burning, scratchiness, or itching. The afflicted eye may produce more tears than usual or seem to be "trapped shut" when you first wake up. An enlargement of the white portion of the eye is another potential complication. [1] Itchiness is more likely in those who suffer from allergic reactions. One or both of a patient's eyes may be affected by conjunctivitis.

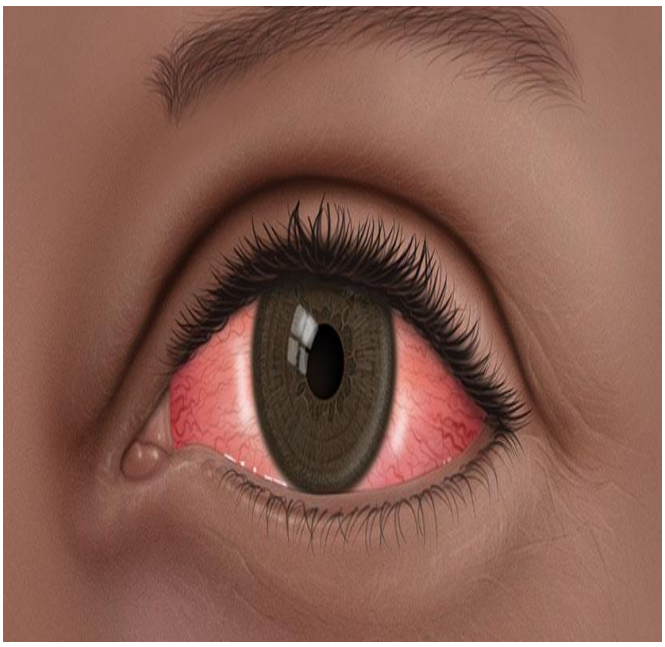

Fig 01: Conjunctivitis [Courtesy; google]

Viral infections are the most prevalent infectious cause, followed by bacterial infections. The viral infection could manifest itself with the other signs and symptoms of a cold or the flu. Infections of a viral or bacterial nature may quickly spread from one person to another. Pollen or animal hair allergies are other typical causes of atopic dermatitis. The indications and symptoms often serve as the foundation for a diagnosis. Culture is sometimes performed on a specimen taken from the discharge every so often. Handwashing is an important aspect of preventing disease.[2] The treatment is determined by the underlying cause of the condition. There is not a single medication that can be used for the vast majority of viral illnesses. The majority of instances that are caused by a bacterial infection also get well without treatment; however, drugs may decrease the duration of the disease. Individuals who use contact lenses as well as those whose infection is brought on by gonorrhea or chlamydia should get treatment for their condition. Antihistamines and mast cell inhibitor drops are both viable treatment options for allergic reactions. Every year, conjunctivitis affects around 3 million to 6 million individuals in the United States.[3] The most frequent causes of illness in adults are viral, while

the most common causes of illness in children are bacterial. In most cases, recovery takes between one and two weeks to complete. Further diagnosis and treatment may be necessary if there is a loss of vision, considerable discomfort, sensitivity to light, evidence of herpes, or if symptoms do not resolve within a week. Neonatal conjunctivitis, another kind of conjunctivitis that may affect newborns, may also need specialized medical attention. [4]

1.2.History

In 1953, Rowe et al. became the first people to successfully isolate an adenovirus. Jawetz et al. reported their findings on pandemic keratoconjunctivitis after a period of two years:437 The condition is often referred to by the slang name "Madras eye" when it is discussed in India. The effects of conjunctivitis on both the economy and society are significant. It was anticipated that the expense of treating bacterial conjunctivitis in the United States would range between $377 million to $857 million per year. It is estimated that around one percent of all office visits for primary care in the United States are due to conjunctivitis. Roughly 70 percent of the patients diagnosed with acute conjunctivitis seek treatment in primary care or urgent care facilities.[5]

1.3. Signs and symptoms

All varieties of conjunctivitis have the same classic symptoms: red eye, conjunctival swelling, and watery eyes. The pupils, however, should respond properly. Inflammation of the conjunctiva, seen as redness and irritation, is diagnostic of conjunctivitis. Examination utilizing a slit light (biomicroscope) may increase diagnostic accuracy. In most cases, it is more informative to examine the palpebral conjunctiva, which covers the insides of the eyelids, than the bulbar conjunctiva, which covers the whites of the eyes. In this case, a citation is required.

Viral

Adenoviruses are responsible for 65–90% of all occurrences of viral conjunctivitis.[6] Common colds, sore throats, and other upper respiratory tract infections often accompany viral conjunctivitis. Its symptoms include excessive watering and itching. The infection normally originates in one eye but may move readily to the other eye. Viral conjunctivitis presents as a thin, diffuse pinkness of the conjunctiva which may be mistaken for iritis, however corroborative

symptoms on microscopy, notably many lymphoid follicles on the tarsal conjunctiva, and often punctate keratitis are visible.

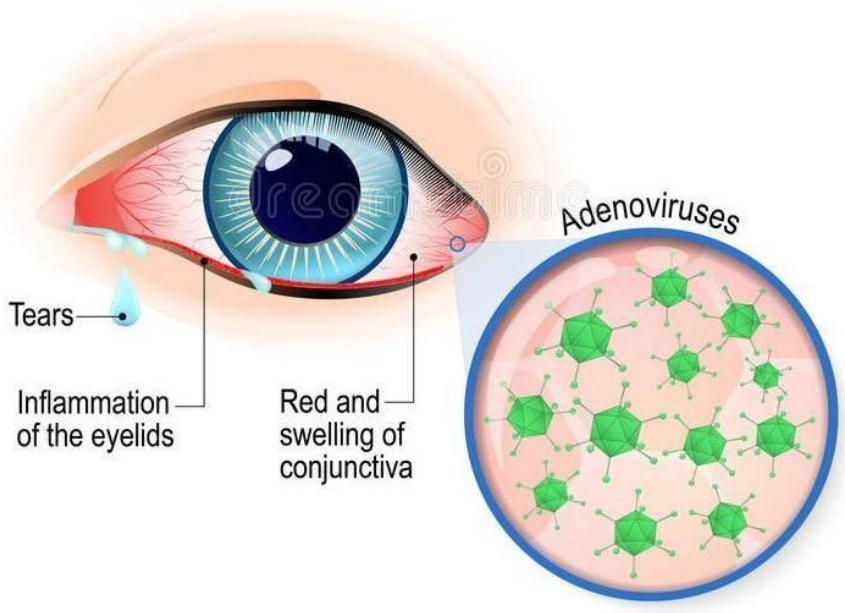

Fig 02: Viral Conjunctivitis [Courtesy; google]

Allergic

An eye with allergic conjunctivitis demonstrating conjunctival edema. Inflammation of the conjunctiva caused by allergies is called allergic conjunctivitis.[7] Patients may have varying sensitivities to allergies. Redness (mostly owing to dilatation of the peripheral tiny blood vessels), swelling of the conjunctiva, itching, and increased production of tears are all symptoms caused by the release of histamine and other active chemicals by mast cells.

Bacterial

Bacterial conjunctivitis causes the fast development of conjunctival redness, swelling of the eyelid, and a sticky discharge. Usually affecting just one eye at first, the symptoms may progress to the other in as little as two to five days. Common pus-producing bacteria produce conjunctivitis, which manifests as a gritty or irritating sensation and a discharge that is either grey or yellow in color and stringy in consistency. This may make the lids cling together, particularly in the morning. Severe crusting of the infected eye and the surrounding skin may also develop. In extreme cases, patients may claim that a foreign substance is embedded in their eye because of how localized the gritty or scratchy sensation is. In this case, a citation is required. Common bacteria responsible for nonacute bacterial conjunctivitis include Staphylococcus, Streptococcus,[8] and Hemophilus species. In rare cases, Chlamydia spp. may be to blame. [9]

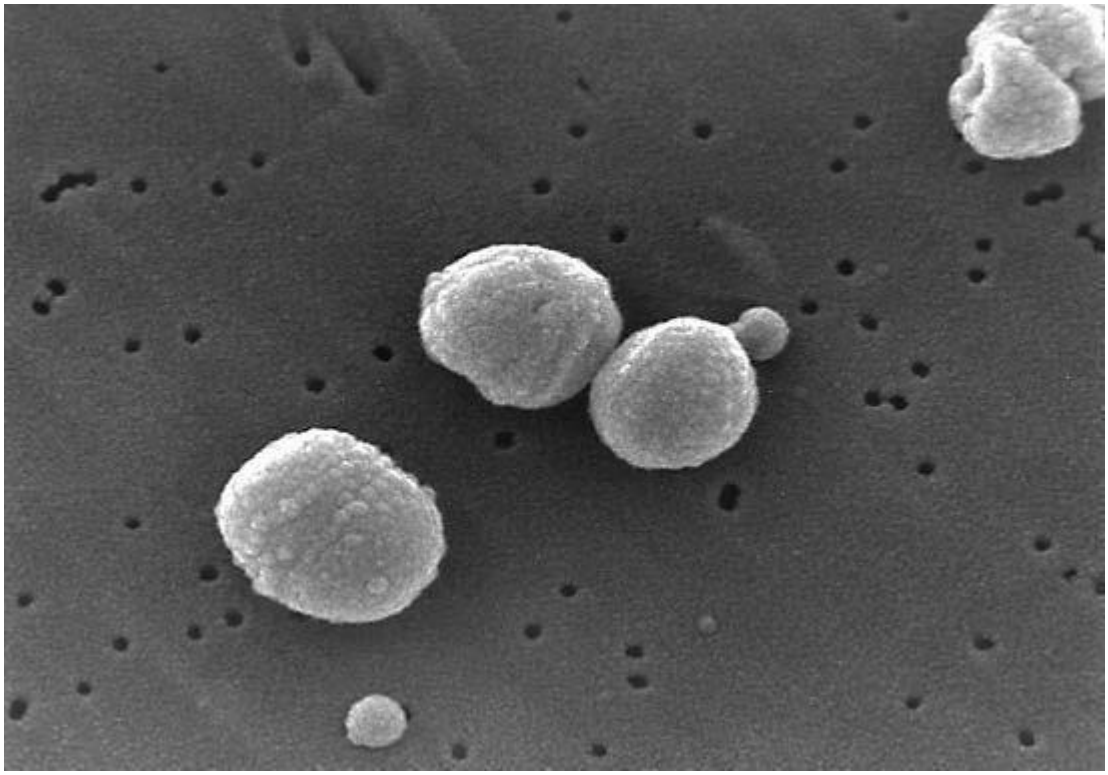

Fig 03: Streptococcus [Courtesy; google]

Typical membranous conjunctivitis

Nonexudative but chronic conjunctivitis without considerable redness may be caused by bacteria like Chlamydia trachomatis or Moraxella spp. Membranes or pseudomembranes may form across the conjunctiva in cases of bacterial conjunctivitis. Pseudomembranes consist of a mix of inflammatory cells and exudates and attach loosely to the conjunctiva, whereas real membranes are more securely adherent and cannot be readily pulled away. Neisseria gonorrhoeae, beta-hemolytic streptococci, and Corynebacterium diphtheriae are all bacteria that may cause conjunctivitis by producing membranes or pseudomembranes. Unimmunized infants develop a membrane over their conjunctiva due to C. diphtheriae. [10]

Chemical

If anything, acidic or alkaline gets in your eye, you might end up with chemical eye damage. It is often true that alkali burns are more severe than acid burns, [11] but not always. Conjunctivitis is the result of mild burns, but corneal whitening may result from severe burns. To check for chemical reasons, you may use litmus paper. Upon determining that a chemical factor is to blame, the affected eye or eyes should be flushed until the pH is in the range of 6-8. Put some drops in your eyes that include an anesthetic to relieve the discomfort. The redness of the eye is the most obvious symptom of irritant or toxic conjunctivitis. If related to a chemical splash, it is generally evident in just the lower conjunctival sac. Necrosis of the conjunctiva, especially when exposed to caustic alkalis like sodium hydroxide, may cause a white eye from vascular closure and subsequent epithelial sloughing after exposure to these chemicals. The presence of anterior uveitis may be confirmed by a slit lamp examination. In this case, a citation is required.[12]

Other

- ✓ An infected eye is caused by chlamydial conjunctivitis.
- ✓ Inclusion conjunctivitis of the infant is conjunctivitis that may be caused by the bacteria Chlamydia trachomatis and may develop into acute, purulent conjunctivitis. Self-healing, however, is the norm. [13]

1.4. Causes

The vast majority of cases of infectious conjunctivitis are brought on by a virus. Various typical reasons include bacterial infections, allergies, other irritants, and dryness. Infections caused by bacteria and viruses may spread from person to person or be passed on via contaminated surfaces or liquids. The common cold is a frequent cause of conjunctivitis, as is contact with infected fingers. It is possible for bacteria to infect the conjunctiva from a number of other sites, including the nasopharynx, contaminated eye drops or contact lenses, the genitalia, the bloodstream, and the margins of the eyelids and surrounding skin. [14] Sixty-five to ninety percent of all instances of viral conjunctivitis are caused by infection with human adenovirus. [15]

Viral

Most cases of viral conjunctivitis are caused by adenoviruses (adenoviral keratoconjunctivitis). [16] Acyclovir is used to treat herpetic keratoconjunctivitis, an eye infection caused by herpes simplex viruses. Enterovirus 70 and coxsackievirus A24 are the two most common causes of acute hemorrhagic conjunctivitis, both of which are very infectious diseases. This was initially discovered in 1969 during an epidemic in Ghana and has since spread globally, triggering many pandemics. [17]

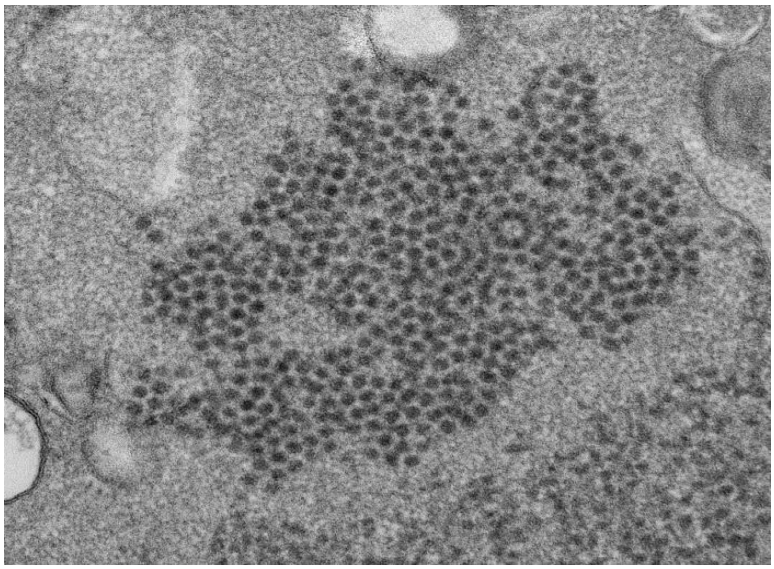

Fig 04: Enterovirus 70 [Courtesy; google]

Bacterial

Staphylococcus aureus, Streptococcus pneumoniae, and Haemophilus influenzae are the most prevalent bacterial causes of acute conjunctivitis. While hyperacute instances are uncommon, they are often brought on by Neisseria gonorrhoeae or Neisseria meningitidis. If your case of bacterial conjunctivitis has lasted more than three weeks, it is likely to be chronic and caused by Staphylococcus aureus, Moraxella lacuna, or Gram-negative intestinal flora. [18]

Fig 05: Streptococcus pneumoniae [Courtesy; google]

Allergic

Pollen, cosmetics, smoking, dust mites, Balsam of Peru, eye drops, and fragrances are only some of the allergens that have been linked to cases of allergic conjunctivitis [19-21] Allergic conjunctivitis is the most common kind of conjunctivitis, affecting between 15% and 40% of the population. [22] About 15% of all visits to primary care physicians are for allergic conjunctivitis,

the most common causes of which being pollen and other airborne allergens in the spring and summer, as well as year-round conditions. [23]

Other

- ✓ Syndrome of Computerized Visual Perception
- ✓ Causes of dry eyes

Conjunctivitis is one leg of the trio that makes up reactive arthritis, which is hypothesized to be brought on by autoimmune cross-reactivity after exposure to certain bacteria. HLA-B27 has been linked to a higher risk of reactive arthritis. Relapsing polychondritis is an autoimmune illness that has been linked to conjunctivitis. [24-25]

1.5. Diagnosis

Since traditional treatments or the passage of time cure the vast majority of illnesses, collecting culture is neither common nor required. If there is a suspicion of bacterial conjunctivitis but there is no response to the topical medications being used, then swabs should be taken and checked for bacterial culture. It is possible that growing the virus will be required in situations when there is a cluster of cases that resemble an epidemic. A skin patch test may be used to determine the offending allergen in a case of allergic conjunctivitis. This allows for the allergen to be avoided in the future.[26] Conjunctival scrapes for the purpose of cytology are not commonly performed due to factors such as cost and a general lack of laboratory personnel competent in handling ocular specimens. This is despite the fact that they are useful in identifying chlamydial and fungal infections, allergies, and dysplasia. An incisional biopsy of the conjunctiva may be conducted if there is a strong clinical suspicion of granulomatous illnesses (such as sarcoidosis) or dysplasia.

Differential diagnosis

Infectious keratitis, angle-closure glaucoma, or iritis are some of the more severe illnesses that might present themselves with a red eye as a symptom. Ophthalmologists should be consulted as soon as possible for the treatment of these disorders. It may be difficult to see, have a considerably enhanced sensitivity to light, be unable to keep the eye open, have a pupil that does not react to light, or have a strong headache that is accompanied by nausea if you have one of these disorders. Tearing and mucoid discharge are two of the most prevalent causes of fluctuating blurriness.

Photophobia of a milder degree is rather prevalent. However, if any of these symptoms are very evident, it is essential to evaluate other disorders, including glaucoma, uveitis, keratitis, and even meningitis or cortico-cavernous fistula. In order to provide a more complete differential diagnosis for the red or sore eye, the following are included:[27]

- Corneal abrasion
- Hemorrhage under the conjunctiva
- Pinguecula
- Blepharitis
- Dacryocystitis
- Keratoconjunctivitis sicca (dry eye)
- Keratitis
- Herpes simplex
- Herpes zoster
- Episcleritis is an inflammatory disorder that provides a look similar to that of conjunctivitis, but without the discharge or tearing that is often associated with conjunctivitis.
- Uveitis
- Acute angle-closure glaucoma
- Endophthalmitis
- Orbital cellulitis [28]

1.6. Conjunctivitis risk factors

Infectious conjunctivitis is most often spread via coming into touch with the discharge from an infected person's eyes, either directly or indirectly. A history of ocular illnesses (dry eye, blepharitis, and anatomic abnormalities of the ocular surface), recent ocular surgery, drug usage, and autoimmune disorders are all common risk factors for conjunctivitis. Further, infants delivered to moms infected with Neisseria gonorrhoeae or Chlamydia trachomatis are more likely to develop conjunctivitis if the birth was accomplished by vaginal delivery. [29-30]

Risk Factors

Conjunctivitis Infectious

Infectious conjunctivitis is often brought on by the following:[31-34]

- The state of bathroom cleanliness
- Neglected usage of contact lenses
- Pieces of clothing and other belongings that may be contaminated
- Difficulty getting around due to a crowded environment (elementary schools, military barracks)
- Dry eyes, blepharitis, and lid and ocular surface anatomic anomalies in the family tree
- Ocular foreign bodies, suture exposure, or recent ocular surgery
- Applying for topical medicines often over time
- Immune deficiency
- Seasons of Winter and Summer (bacterial conjunctivitis peaks in the winter and viral conjunctivitis peaks in the summer)

Conjunctivitis in Newborns

The most common causes of conjunctivitis in newborns are:[35-37]

- Birth-related maternal infections
- HIV-positive moms
- Risk of Infectious Disease Transmission to Infants
- Membrane rupture prematurity (PROM)
- Ocular postnatal prophylaxis insufficiency
- An Effect of Silver Nitrate
- Birth-related Ocular Trauma
- Artificial breathing system
- Prematurity
- Subpar prenatal care
- Unsanitary circumstances during labor and birth

Conjunctivitis Allergic

Frequent triggers for allergic conjunctivitis include:[38]

- Tree and grass pollen
- Tissues from animals and their fluids like saliva
- Perfumes
- Cosmetics
- Contamination of the Air
- Smoke

Keratoconjunctivitis Sicca

Factors that increase the likelihood of developing keratoconjunctivitis sicca (dry eye syndrome) include:[39].

- Allergies
- Reduced levels of hormones (aging and pregnancy)
- Thyroid-related eye disease
- Blepharitis
- Intake of Medications (antihistamines, beta-blockers, pain relievers, sleep aid, diuretics, hormone replacement, and oral contraceptives)
- Sjogren's syndrome, lupus, and rheumatoid arthritis are examples of autoimmune diseases.
- Eye operation
- Lack of blinking (as in, for instance, Parkinson's disease or prolonged computer use)
- Environmental (dusty or windy) (dusty or windy)
- Applying a contact lens
- Stroke, Bell's palsy, Parkinson's disease, and trigeminal nerve dysfunction are all examples of neurological disorders.
- Uveitis
- Iritis
- Diabetes

- Caused by a lack of vitamin A,

Superior Limbic Keratoconjunctivitis

Superior limbic keratoconjunctivitis (SLK) is a condition characterized by inflammation of the conjunctiva that may affect either eye [40]

- Microtrauma in soft tissues caused by mechanical forces (conjunctiva laxity)
- Variations in the structure of the upper conjunctiva
- Constantly covering one's eyes
- Abnormalities in the thyroid

1.7. Types of conjunctivitis

There are three main types of conjunctivitis: allergic, infectious, and chemical. The cause of conjunctivitis varies depending on the type.

1.7.1. Allergic conjunctivitis

Inflammation of the conjunctiva (the membrane covering the white area of the eye) as a result of an allergic reaction is known as allergic conjunctivitis (AC). [41] Although a number of factors contribute to a patient's allergic reaction, hay fever is often at the top of the list. Redness (mostly due to dilatation of the peripheral tiny blood vessels), edema (swelling) of the conjunctiva, itching and increased lacrimation are all symptoms (production of tears).

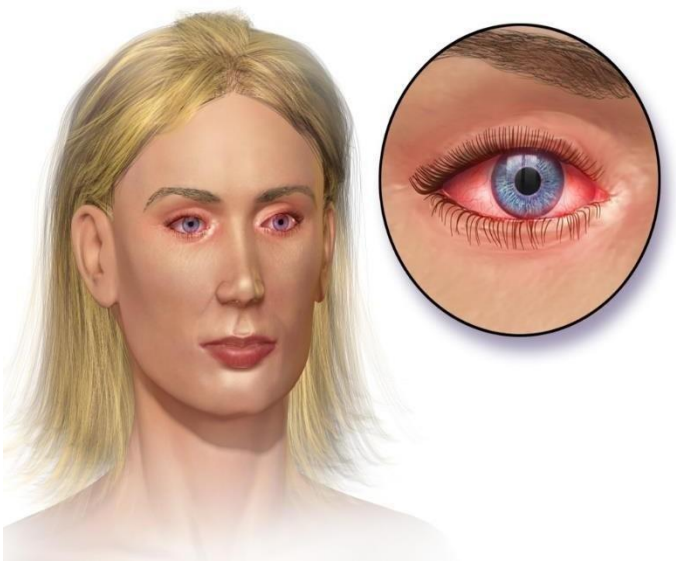

Fig 06: Allergic conjunctivitis [Courtesy; google]

The disorder is known as allergic rhinoconjunctivitis if it also includes rhinitis (ARC). Histamine and other active chemicals released by mast cells cause vasodilation, nerve-ending irritation, and increased tear production, the classic signs of hay fever. Treatment for allergic conjunctivitis includes avoiding the allergen (such as staying inside while the grass is in flower during "hay fever

season") and using antihistamines, either topically (in contact with the skin) or orally (by swallowing).

Signs and symptoms Allergic conjunctivitis

The thin membrane that lines the eyeball is called the conjunctiva. Ocular irritation, eyelid swelling, tears, photophobia, watery discharge, and a foreign body feeling are among the symptoms that may develop in the eye when an allergen irritates the conjunctiva (with pain). [42-43] More than 75% of individuals seeking therapy for ocular allergies report itching as a primary symptom. Warm, dry weather tends to aggravate patients' conditions, whereas colder temperatures and rain seem to alleviate them. The cornea develops tiny yellow nodules that ulcerate after a few days in phlyctenular keratoconjunctivitis. [44] As well as causing physical pain, research by Klein et al. found that allergic conjunctivitis also leads patients to change their daily routines by cutting out on things like going outside, reading, sleeping, and driving. As a result, treating people with allergic conjunctivitis might improve their general quality of life.

Causes Allergic conjunctivitis

Allergic conjunctivitis is brought on by an immune system response to an allergen. People who suffer from hay fever, asthma, or eczema are more likely to also get allergic conjunctivitis. To paraphrase

These are some of the most frequent allergens that trigger conjunctivitis:[45]

- Allergens such as weed, grass, and tree pollen
- Skin and other animal secretions like saliva
- Perfumes
- Cosmetics
- Drugs used to treat the skin
- Pollution of the atmosphere
- Smoke
- Migrant microscopic parasites that live in dust
- Peruvian balsam (used in food and drink for flavoring, in perfumes and toiletries for fragrance, and in medicine and pharmaceutical items for healing properties)

- Ophthalmic ointment (A reaction to preservatives in eye drops can cause toxic conjunctivitis)
- Eye drops for contacts (conjunctivitis, an inflammation of the clear membrane of the eye, may be brought on by prolonged exposure to some preservatives).
- Eyewear that has a contact lens on it (conjunctivitis is also caused by repeated mechanical irritation of the conjunctiva by contact lens wearers)

Most occurrences of seasonal conjunctivitis occur during hay fever season when pollen from grasses and other plants is present. Symptoms may also be brought on by molds and other spores later in the summer.[46]

1.7.2. Infectious Conjunctivitis

The conjunctiva is susceptible to infection from a wide range of bacteria (the membrane that lines the eyelid and covers the white of the eye). Viruses, specifically members of the family of viruses known as adenoviruses, make up the vast majority of all known creatures. Bacterial infections are less prevalent. Both viral and bacterial conjunctivitis are highly infectious, meaning that they may quickly spread from one person to another, or from the infected eye of a person to the uninfected eye of the same person. Some viruses that produce symptoms all throughout the body also cause the eyes to become red and inflamed. [47] These types of viral diseases include measles, mumps, rubella, chickenpox, and Zika viruses, as well as certain viruses that induce symptoms similar to those of the common cold and the flu. SARS-CoV2 may induce conjunctivitis. Individuals who take corticosteroid eye drops for an extended period of time or have eye injuries involving organic materials like plants or soil are more likely to get a fungal infection than other people. Fungal infections are uncommon. Infections of the eye caused by Chlamydia trachomatis or Neisseria gonorrhoeae, which are acquired by newborns from organisms in the birth canal of their mothers, are especially dangerous for infants who have just been born (conjunctivitis of the newborn). Inclusion conjunctivitis is a kind of conjunctivitis that tends to linger for a very extended period of time. It is caused by certain strains of the bacterium Chlamydia trachomatis. Inclusion conjunctivitis is often transmitted by contact with the genital secretions of a person who has a chlamydial infection of the genitourinary tract. Chlamydia trachomatis is the pathogen that causes trachoma, which is a subtype of conjunctivitis. Genital chlamydia is not the source of this condition. Conjunctivitis caused by Neisseria gonorrhoeae, often known as gonorrhea, is known

as gonococcal conjunctivitis. Gonorrhea is a sexually transmitted illness that may also travel to the eye by contact with the vaginal secretions of a person who has a gonorrheal infection in their genitalia. Scarring of the conjunctiva, which may be caused by severe infections, can lead to irregularities in the tear film. In rare cases, acute conjunctivitis may extend to the cornea, which can result in vision loss (the clear layer in front of the iris and pupil). An allergic response, as opposed to an infection caused by a virus or bacterium, may induce inflammation of the conjunctiva; this condition is referred to as allergic conjunctivitis. [47-48]

Symptoms of Infectious Conjunctivitis

Discharge and a pinkish discoloration of the conjunctiva are signs of infection. In many cases, the discharge causes the eyes to close, especially during sleep. As a side effect, this discharge might produce temporary blurred vision. By blinking away the discharge, vision is restored. When an infection affects the cornea, blinking does not help clear the visual blur. In some cases, exposure to strong light might be painful for the eyes. Scarring of the conjunctiva from a severe infection causes long-term visual problems quite seldom.[49]

The symptoms of viral conjunctivitis are different from those of bacterial conjunctivitis.

- In cases of viral conjunctivitis, patients may have a watery discharge from the eyes, whereas those suffering from bacterial conjunctivitis may experience a thicker white, green, or yellow discharge.
- There is a higher chance that a virus is to blame for an upper respiratory illness.
- With bacterial conjunctivitis, the lymph node in front of the ear is often not swollen and uncomfortable, but with viral conjunctivitis, it may be.

Nevertheless, these indicators are not always reliable for distinguishing viral conjunctivitis from bacterial conjunctivitis. Genital symptoms, such as burning during urination and discharge from the penis or vagina, are common in people with inclusion conjunctivitis or gonorrhea-related conjunctivitis. In newborns, conjunctivitis leads to eyelid irritation and a pus-like discharge.[50]

1.7.3. Chemical conjunctivitis

Getting smoke, liquids, fumes, or chemicals in the eye may lead to a condition known as chemical pink eye (conjunctivitis), sometimes known as poisonous pink eye. It is imperative that urgent

action be taken to eliminate the harmful substance or liquid by rinsing the eye with running water. The chlorine found in swimming pools has been linked to the development of a mild form of pink eye. The vast majority of individuals do not require physicians.

Chemical conjunctivitis symptoms

- Chemical conjunctivitis is an eye condition that may be brought on by exposure to irritants including smoke, fumes, or chlorine (found in swimming pools).
- Crusting or discharge that occurs on the eyelids.
- Excessive crying or eyes that are watery.
- A sensation is similar to that of sand or scratching in the eye.
- Sensitivity to the effects of light
- Eye discomfort.[51]

1.8. Preventive measures for Conjunctivitis

-Avoid making unnecessary contact with your eyes by avoiding touching them with your hands.

-You should wash your hands rather often.

-Always be sure to use a clean towel and washcloth.

-Towels and washcloths are not to be shared with other people.

-If you get the impression that your pillowcases are not clean, you should replace them.

-Don't use eye cosmetics like mascara.

-Eye makeup and other personal eye care supplies should not be shared with other persons under any circumstances.

-Proper hygiene, particularly avoiding contact with contaminated hands, is the best line of defense. In addition, vaccination against adenovirus, Hemophilus influenza, pneumococcus, and Neisseria meningitides is very efficient.

-Studies have shown that using povidone-iodine eye drops may stave against newborn conjunctivitis. Its inexpensive cost has led to widespread adoption around the globe.[52]

1.9. Management

In around 65 percent of cases, the symptoms of conjunctivitis go away on their own within two to five days. In the vast majority of situations, a prescription for antibiotics is not required. [53]

Viral

Conjunctivitis caused by viruses often clears up on its own and does not need any special therapy to get well. In order to alleviate some of the symptoms, you may find that using antihistamines (like diphenhydramine) or mast cell stabilizers (like cromolyn) is helpful. Povidone-iodine has been proposed as a therapy for this condition; however, as of the year 2008, there was insufficient data to support this theory.[54]

Allergic

In mild instances of allergic conjunctivitis, artificial tears may help ease pain, and pouring cold water over the face while the patient's head is tilted downward with a towel over their head might help constrict the capillaries. When symptoms are more severe, a doctor may recommend nonsteroidal anti-inflammatory drugs (NSAIDs) and antihistamines. It's possible that you'll need to use topical steroid drops to treat persistent allergic conjunctivitis.

Bacterial

In most cases, bacterial conjunctivitis clears up on its own without the need for therapy. The use of topical antibiotics may be required only if there is no sign of improvement after three days have passed. Whether therapy was administered or not, there were no adverse effects found. Antibiotics hasten the healing process in bacterial conjunctivitis, which is one reason why their usage could be investigated. People who use contact lenses, are immunocompromised, have an illness that is considered to be caused by chlamydia or gonorrhea, have a significant amount of discomfort, or have copious discharge are additionally encouraged to take antibiotics. Infections caused by gonorrhea or chlamydia need treatment with both oral and topical medicines. The specific bacterial strain, or the strain that is thought to be causing the illness, should guide the selection of an antibiotic. In most cases, treatment with fluoroquinolones, sodium sulfacetamide, or trimethoprim/polymyxin is recommended for seven to ten days. Systemic penicillin may also be used to treat cases of meningococcal conjunctivitis, provided that the strain in question is

susceptible to treatment with the antibiotic. The povidone-iodine ophthalmic solution has also been reported to have some success against bacterial and chlamydial conjunctivitis when it has been explored as a therapy, with a prospective function being proposed in regions where topical medicines are either unavailable or expensive. [55-56]

Chemical

Irrigation with Ringer's lactate or saline solution is the treatment of choice for chemical conjunctivitis, which is caused by exposure to chemicals. Because they may cause serious scarring and damage to the intraocular structures, chemical injuries, and alkali burns, in particular, are considered medical emergencies. People who have conjunctivitis brought on by chemical exposure should avoid touching their eyes in order to prevent spreading the chemical.[57]

1.10. Conjunctivitis care and treatment

The therapy that is advised for conjunctivitis may change depending on the root cause of the condition, which might be an infection, an allergic response, or an irritant like a stray eyelash, example.

Self-care

There are a few different approaches to treating infectious conjunctivitis that may be done at home. The recommendations that are provided below should help relieve some of your discomforts.

- Take out your contact lenses – if you wear contact lenses, take them out until all of the symptoms of the infection have gone away; don't reuse old lenses after the infection has gone away because they could be a potential source of re-infection; always use new contact lenses, solutions, and cases after infection have cleared up.
- Use lubricant eye drops, which are available over-the-counter at pharmacies or may be prescribed for you; these drops may help reduce any discomfort and stickiness that you are experiencing in your eyes; nevertheless, it is important to always follow the directions provided by the manufacturer.
- Utilizing cotton wool that has been moistened in water, carefully remove any sticky discharge from your eyes and lashes.

- Always be sure to wash your hands, but it is especially vital to do so after touching your eyes since this will prevent the illness from spreading to other people.

Antibiotics

Because infective conjunctivitis often gets well on its own and there is very little risk of problems associated with untreated conjunctivitis, antibiotics are not typically administered for the condition. Antibiotics may be recommended to you, however, if the illness is especially severe or if it has lingered for more than two weeks. It is possible for a kid's school or playgroup to demand that the child get antibiotic treatment before they are allowed to return, although this is rather uncommon. There are many different kinds of antibiotics available, but the most common ones are chloramphenicol and fusidic acid.

Fig 07: Antibiotics [Courtesy; google]

Chloramphenicol

Antibiotic eye drops containing chloramphenicol are often the first line of treatment recommended for bacterial eye infections. As a treatment for bacterial conjunctivitis, it may be obtained from pharmacies without the need for a prescription. If you want to get the best possible results from using chloramphenicol, you need to make sure that you follow the instructions that your pharmacist gives you regarding how and when to use it. Alternatively, you can read the patient information

leaflet that is included with the medication to ensure that you are using it correctly. If the antibiotic can't be administered to you effectively via eye drops, it could be recommended to you as an eye ointment instead.

Fig 08: Chloramphenicol [Courtesy; google]

Fusidic acid

If chloramphenicol is not an appropriate treatment for you, your doctor may recommend fusidic acid instead. Because it does not need them as frequently application, it is often preferable for the treatment of young children and the elderly. Additionally, it is the therapy of choice for women who are pregnant. Fusidic acid, much like chloramphenicol, is available in the form of eye drops

and should be used in accordance with the recommendations of your physician or the directions that are included with the drug itself. Vision may become temporarily cloudy after using eye drops. It's best not to go behind the wheel or operate heavy equipment just after taking eye drops. Both chloramphenicol and fusidic acid have the potential to create additional adverse effects. One of them is a mild stinging or burning sensation in the eye, although this should not remain for an extended period of time.

Fig 09: Fusidic acid [Courtesy; google]

Additional medical attention

If you still have symptoms after two weeks, it is imperative that you make an appointment with your primary care physician. You should also make an emergency appointment with your primary care physician as soon as possible if you have any of the following symptoms:

- ✓ eye discomfort
- ✓ light sensitivity; photosensitivity (photophobia)
- ✓ obscuring one's view

- ✓ severe blushing of either one or both of the eyes

Literature Review

21. Terrence P O'Brien, Bennie H. Jeng, Marguerite McDonald &Michael B. Raizman "Acute conjunctivitis: truth and misconceptions" Volume 25, 2009 - Issue 8.

Acute conjunctivitis is a disorder that affects a lot of people and may have a serious economic and morbidity impact. Despite this, there is a lot of debate over the condition's prevalence, diagnosis, management, and therapy. To study and debate the most recent evidence-based literature as it relates to each of these enduring disputes, an expert panel of ophthalmologists was put together. Adenovirus-related episodes of acute microbial conjunctivitis in particular have received a lot of attention. Emerging research has disproved several beliefs that have persisted for years. Improved management and treatment choices will benefit patients while lowering overall healthcare costs as a result of the development and use of better diagnostic tools and antiviral drugs by physicians.

22. Gary L. Morrow, M.D., And Richard L. Abbott, M.D. "Conjunctivitis" Am Fam Physician. 1998;57(4):735-746.

Inflammation of the conjunctiva, the membrane that lines the eyelids and covers the sclera's visible surface, is referred to as conjunctivitis. It is the most typical cause of a condition known as "red eye." In most cases, the etiology may be ascertained by performing a thorough history and an eye examination; nevertheless, a culture may sometimes be required in order to confirm the diagnosis or to direct the treatment. Bacteria and viruses are often the culprits in cases of conjunctivitis. When acute, bilateral conjunctivitis with purulent discharge is observed in an adult who is sexually active or in a newborn infant three to five days after delivery, a Neisseria infection should be considered. Conjunctivitis brought on by Chlamydia trachomatis or Neisseria gonorrhoeae needs intensive antibiotic treatment, although conjunctivitis brought on by other bacteria is often self-limiting and does not require treatment. Chronic conjunctivitis is often accompanied by blepharitis, recurrent styes, or meibomianitis. conjunctivitis is an inflammation of the conjunctiva in order to treat the condition, proper eyelid cleanliness is required, as is the administration of topical antibiotics based on the culture results. An extreme itching sensation is a telltale sign of allergic conjunctivitis, as is direct contact with the offending allergen. The majority of the time, topically applied antihistamines, mast-cell stabilizers, or anti-inflammatory medications are used to treat this illness.

23. Amir A. Azari, MD. Neal P. Barney, MD "A Systematic Review of Diagnosis and Treatment" JAMA. 2013;310(16):1721-1730.

The most frequent underlying cause of infectious conjunctivitis, viral conjunctivitis often goes untreated and presents with a variety of signs and symptoms. The majority of simple instances of bacterial conjunctivitis resolve in 1 to 2 weeks, making it the second most frequent cause of infectious conjunctivitis. The clearest indicators of bacterial conjunctivitis include mattering and adhesion of the eyelids upon awakening, absence of itching, and lack of a history of conjunctivitis. Bacterial conjunctivitis is treated with topical antibiotics, which allows for an earlier return to work or school. In addition to topical antibiotic therapy, conjunctivitis related to STDs like chlamydia and gonorrhea needs systemic therapy. Up to 40% of people have allergic conjunctivitis, although only a tiny percentage of these people seek medical attention. Topical antihistamines and mast cell inhibitors are used to treat allergic conjunctivitis since itching is its most common symptom. In most instances of bacterial conjunctivitis, there is no need for treatment since the condition usually resolves on its own. However, conjunctivitis in contact lens users and conjunctivitis brought on by gonorrhea or chlamydia should be treated with antibiotics. Viral conjunctivitis is treated with supportive care. Antihistamine and mast cell stabilizer therapy reduces allergic conjunctivitis symptoms.

24. Lorenzo Loffredo, MD, Fernanda Pacella, MD, et all "Conjunctivitis and COVID-19: A meta-analysis" J Med Virol. 2020 Sep; 92(9): 1413–1414.

Wuhan had the first epidemic of the coronavirus illness 2019 (COVID-19), which then expanded to the rest of the globe. The severe form of COVID-19 is characterized by severe pneumonia, acute respiratory distress syndrome (ARDS), and hypercoagulation. The lungs are the location of the illness that is most often affected. The precise COVID-19 transmission path has not yet been determined. Some authors proposed that COVID-19 droplets or contaminated hands may potentially contaminate the conjunctiva, which might serve as the starting location of a disseminated illness. The respiratory tract is likely not the sole mode of transmission for this viral infection. Conjunctivitis, popularly known as "Pink eye," is a common condition with a bacterial or viral cause. This has been linked to coronavirus infections in both people and animals in the

past. Recent research suggested that COVID-19 may appear as conjunctivitis. It is interesting to examine the relationship between conjunctivitis and the severity of COVID-19 since the eye might be thought of as a direct possible channel of entry for the virus. However, there are few inconsistent data available. Only three studies specifically on the Chinese population, each with a distinct set of findings, covered this subject.

25. Gunnar Høvding "Acute bacterial conjunctivitis" Acta Ophthalmologica 28 June 2008; 86

The most frequent eye condition seen by general practitioners is acute bacterial conjunctivitis, which is thought to account for 1% of all primary care visits. The epidemiology, etiology, clinical presentation, complications, differential diagnosis, in vitro tests, and treatment of acute bacterial conjunctivitis are all reviewed in this article. Since topical antibiotic therapy typically shortens the disease's duration and enables an early return of children to kindergarten or school, it has traditionally been recommended by both doctors and patients. The well-known clinical experience that the disease has an excellent prognosis and a high frequency of spontaneous remission has recently been supported by a number of primary care publications. Accordingly, it is now commonly and strongly advised to adopt an expectant mindset or a delayed prescription policy. These results also highlight how challenging it is to accurately distinguish between viral and bacterial conjunctivitis clinically. It is yet unclear how widespread non-prescription attitudes affect pathogen transmission rates. When determining how to approach these patients, this must be kept in mind. The benefits and drawbacks of various treatment philosophies from socioeconomic and medical perspectives are examined, and a very subjective opinion on the best patient management approach is also provided.

Purpose of this study

Pink eye, also known as conjunctivitis, is an inflammation or infection of the conjunctiva, which is a thin, clear membrane that lines the inside of your eyelid and covers the white area of your eyeball. When there is inflammation in the tiny blood vessels that are seen in the conjunctiva. People are being infected with conjunctivitis at an alarmingly high rate, and the objective of this study is outlined in more detail below.

- To see the condition of Conjunctivitis diseases in Bangladesh.
- To identify the primary cause of conjunctivitis
- In order to determine what age group is most likely to be impacted by conjunctivitis
- To provide a summary of the most popular medications used to treat conjunctivitis.
- To see what people, think about this disease.
- To open a new area of higher studies.

Methodology

4.1. Introduction:

The questionnaire starts with a review and 24 questions that are right on target. There are 109 patient wares who took part in this study.

4.2. Research Design:

I'm doing this survey to find out what people think about conjunctivitis and how it affects their life. The was a completely physical-based cross-sectional study and the questionnaires were created in MS Word the survey was done at the National Institute of Ophthalmology & Hospital.

4.3. Method of Data Analysis:

After an assortment of information, all information was checked for precision and internal consistency to deny missing or clashing data, and those were discarded. Information investigation was done through Microsoft's dominant refreshed rendition.

4.4. Ethical Considerations

Before beginning the information assortment, educated verbal permission was taken from the investigation members. The obscurity of the respondents was kept private, and study subjects were educated that they could have the option to leave the program at any.

4.5. Survey Questionaries

1. Patient Name ……...

2. Gender

- Male
- Female

3. Occupation

- Student
- Job Holder
- Business
- Others

4. Education Level

- College Student
- Undergraduate student
- Postgraduate student

5. Your Age

- Under 20 years old
- 20-40 years old
- Upper 40 years old

6. Location

- Rural
- Urban

7. Do you know about Conjunctivitis?

- Yes
- No

8. Do you suffer from Conjunctivitis?

- Yes
- No

9. How long have you suffered from Conjunctivitis?

- Under one Week
- 1-2 week
- Upper 2 week

10. Symptoms of Conjunctivitis

- The pink or red color in the white of the eye
- Swelling of the conjunctiva
- Increased tear production.
- Itching, irritation, and/or burning.
- All of this

11. What do you think about the cause of Conjunctivitis inflammation

- Infective conjunctivitis
- Allergic conjunctivitis
- Irritant conjunctivitis

12. Do you ever follow up doctor for Conjunctivitis?

- Yes
- No

13. Do you take any medicine for Conjunctivitis?

- Yes
- No

14. Which type of medical therapy do you take for Conjunctivitis?

- Ophthalmic Ointment
- Ophthalmic Drop
- Tablet

15. Is conjunctivitis Spreadable?

- Yes
- No

16. Is conjunctivitis spread through the air?

- Yes
- No

17. Is conjunctivitis sensitive to sunlight

- Yes
- No

18. Is it make any vision problem

- Yes
- No

19. What do think, is conjunctivitis bacterial or viral attack

- Bacterial Attack
- Viral Attack

20. Have you used any natural therapy for conjunctivitis

- Yes
- No

21. Write down the name of the drug you have used for conjunctivitis

…….

22. What class of medicine you have used for conjunctivitis

- Antibiotic drop
- Paracetamol
- Anti-allergic tablet

23. What do you use to wipe your eyelashes?

- Tissue
- Towel.

24. Have you used anyone's towel before infected

- Yes
- No

Result and Discussion

5.1. Gender

Male	**65**
Female	**44**

Table 01: Gender

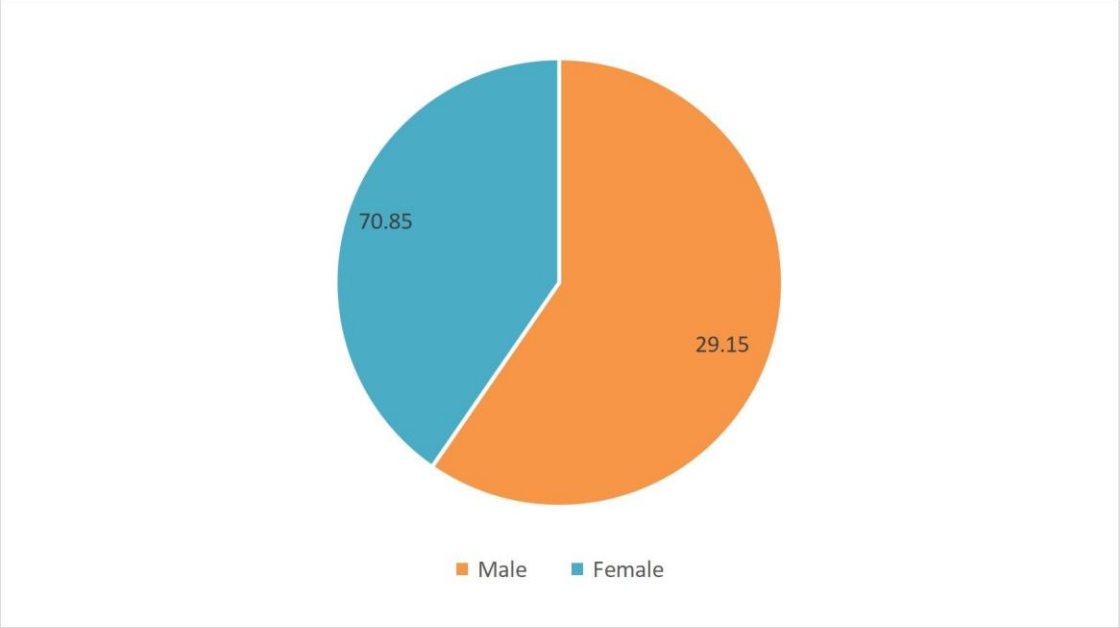

Fig 10: Gender

According to this survey, 70 . 85 % of males are suffering from conjunctivitis. 29.15% of females aresuffering from conjunctivitis.

5.2. Age of patient

Under 20 years	**60**
20-40 Years old	**25**
Upper 40 years old	**24**

Table 02: Age

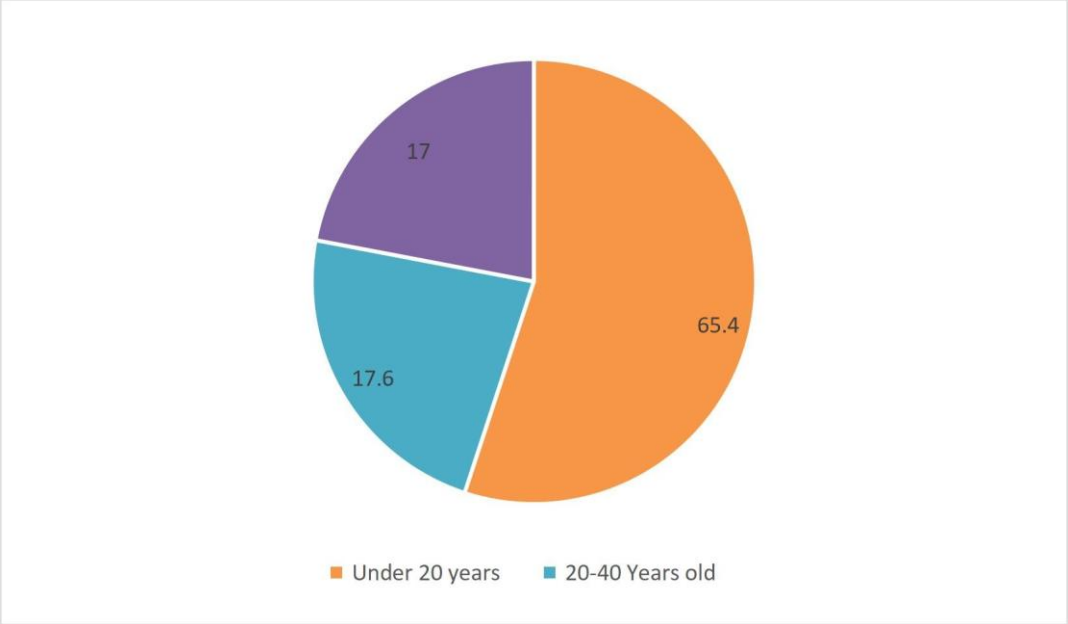

Fig 11: Age

In this survey, 65.4% of sufferers are under 20 years old. 17% are upper 40 years old. and there are 17.6% of sufferers are 20-40 years old. So we can say, teenagers are more suspected of this disease.

5.3. Location of respondents

Rural	**70**
Urban	**39**

Table 03: Location

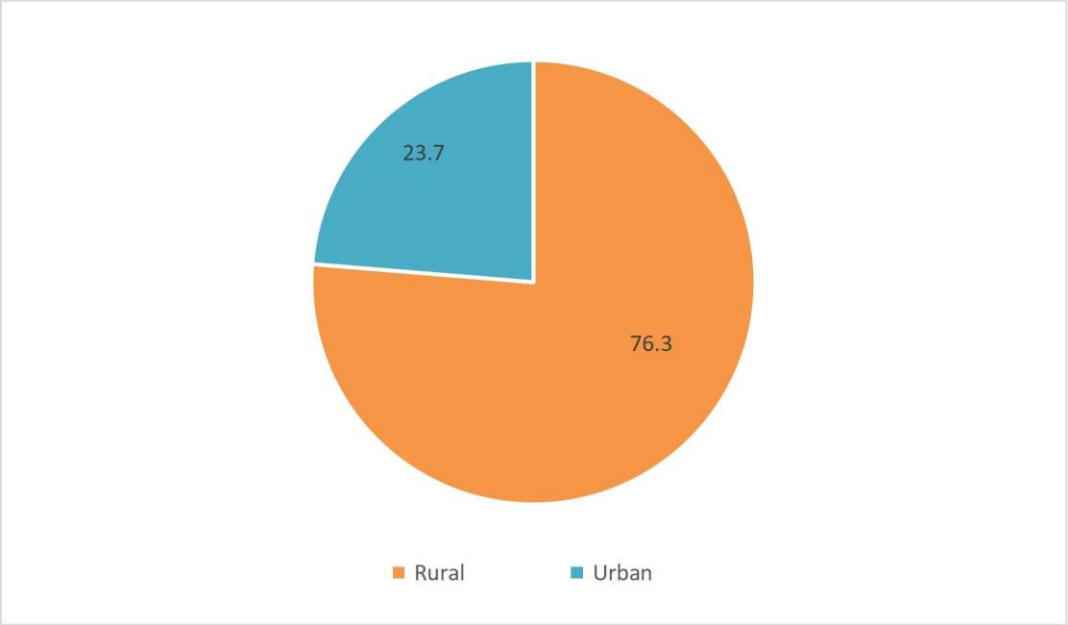

Fig 12: Location

According to this survey, 76.3% of conjunctivitis sufferers are from rural areas. 23.7% are conjunctivitis sufferers from urban areas.

5.4. Knowledge about conjunctivitis of respondents

Yes	**90%**
No	**10%**

Table 04: Knowledge

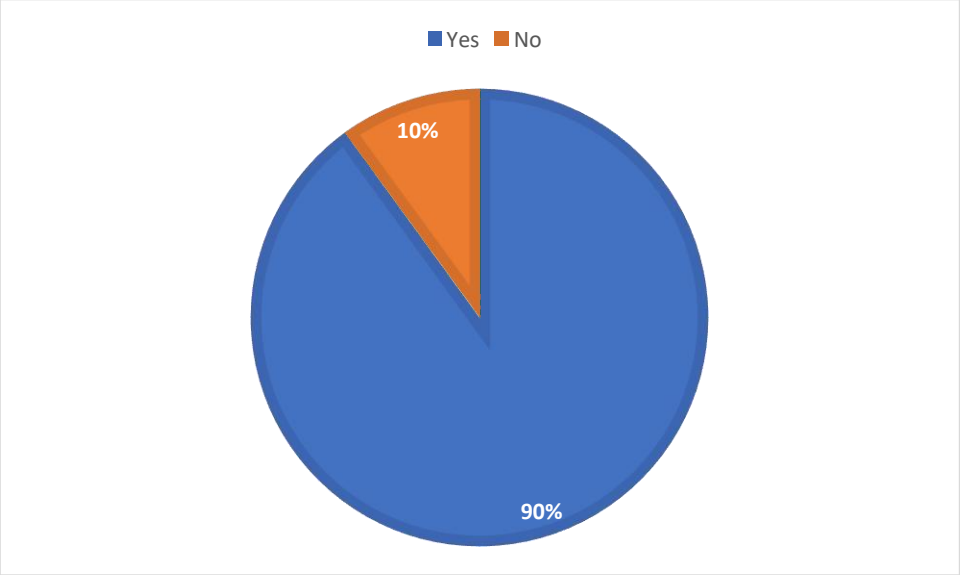

Fig 13: Knowledge

In my findings, 90% of people have knowledge about conjunctivitis. And 10% of people have no idea about this.

5.5. Duration of suffering conjunctivitis

Duration	Patient response in percentage
Under one week	66%
1-2 week	25%
Upper 2 week	9%

Table 05: Duration of suffering conjunctivitis

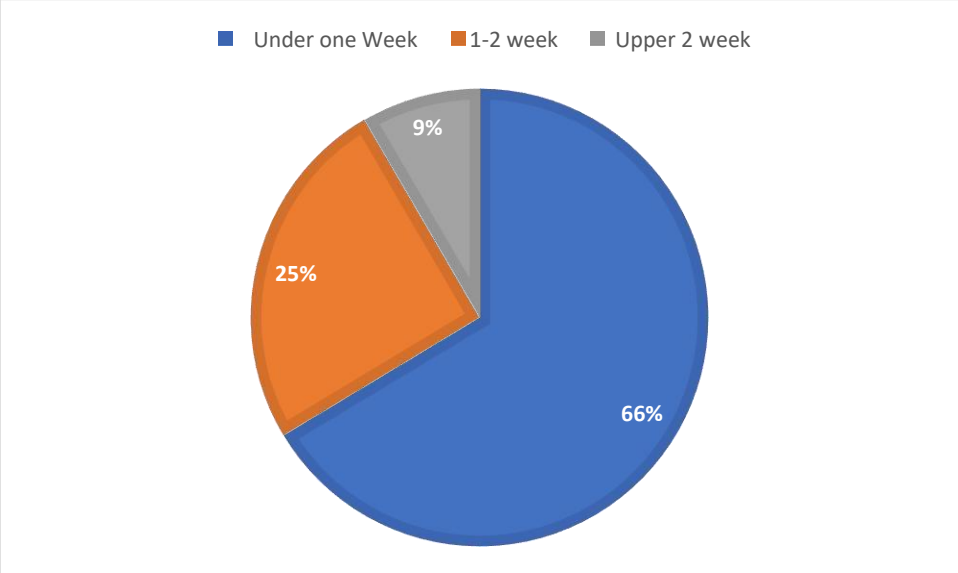

Fig 14: Duration

According to this survey, 66% of people are suffering from conjunctivitis in under one week. 25% are suffering from 1-2 weeks. Only 9% are suffering for more than 2 weeks.

5.6. Follow-up doctor

Regular follow up doctor	Participants response in percentage
Yes	60%
No	40%

Table 06: Follow-up doctor

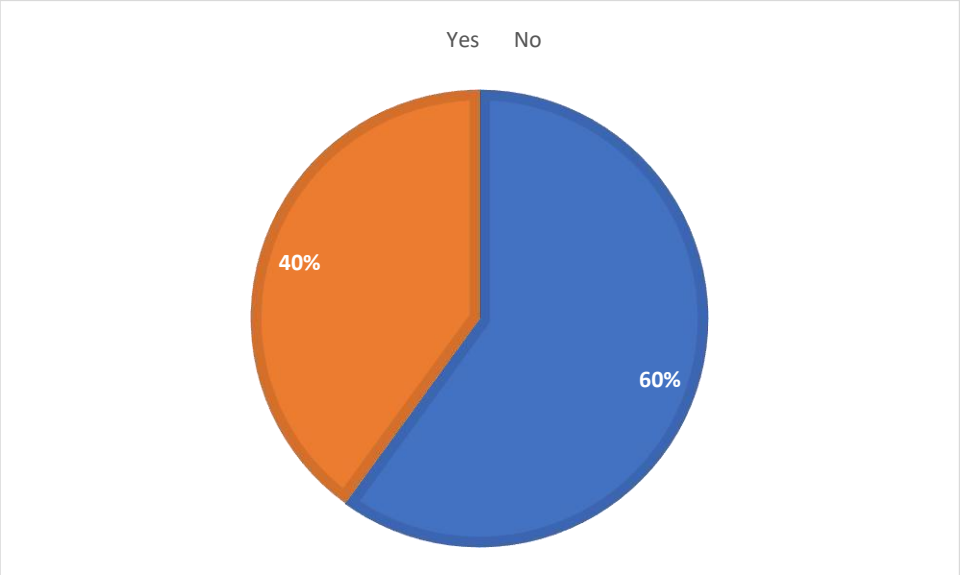

Fig 15: Regular follow-up doctor

In this survey, around 60% of respondents followed up with their doctor for this disease, whereas 40% are not doing this.

5.7. Sensitive to sunlight of conjunctivitis patient

Sensitive to sunlight	Patient response in percentage
Yes	89%
No	11%

Table 07: Sensitive to light

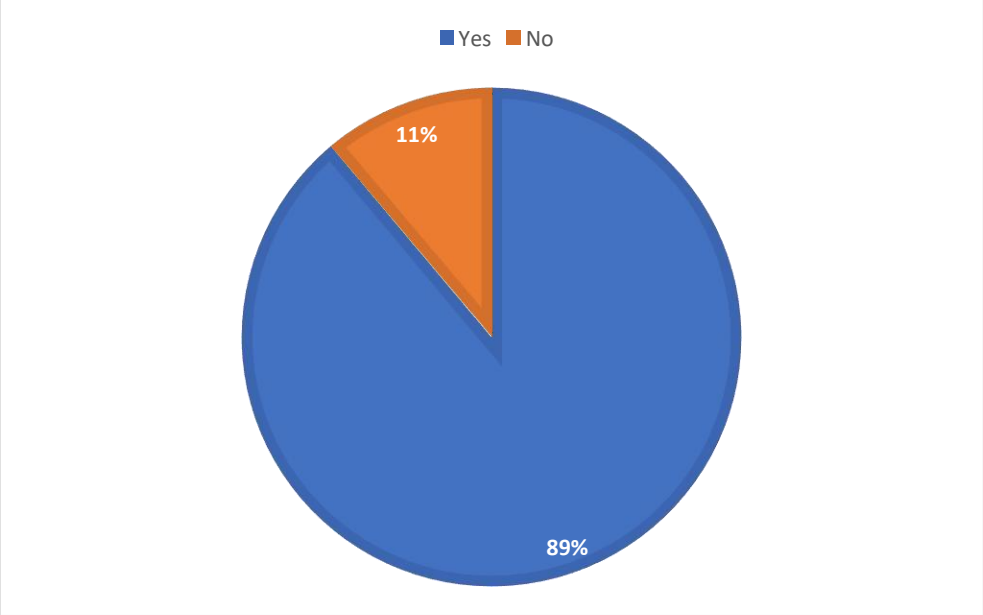

Fig 16: Sensitive to sunlight

In this survey, 89% of people said that it's a sunlight-sensitive disease. and 11% say that it's not sensitive to sunlight.

5.8. Vision problem of patients

Vision problem	Patient respondents
Yes	70%
No	30%

Table 08: Vision Problem

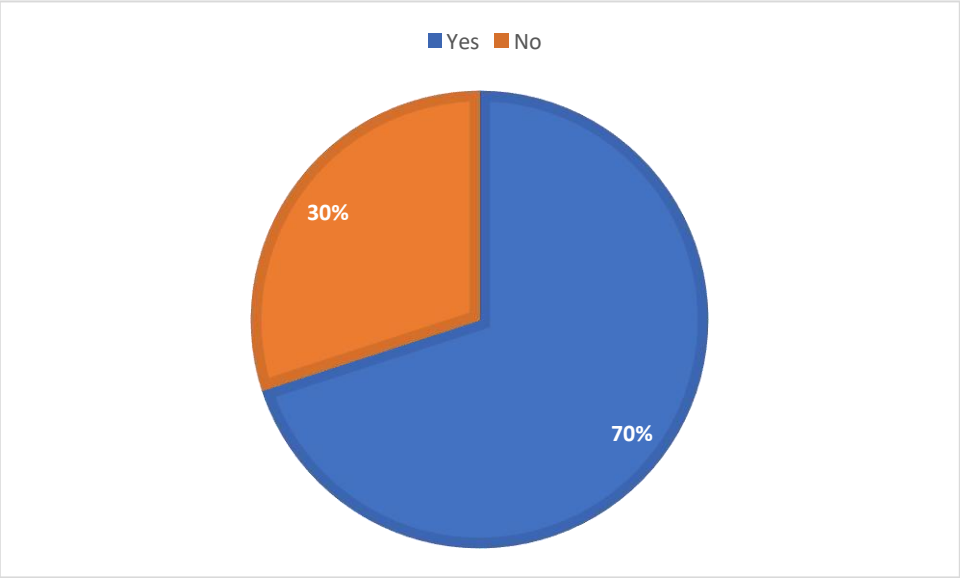

Fig 17: Vision problem

According to this survey, 70% of people faced vision problems. 30% of people are not facing this problem.

5.9. Taking Regular Medication

Taking regular medication	Response in percentage
Yes	95%
No	5%

Table 09: Medication

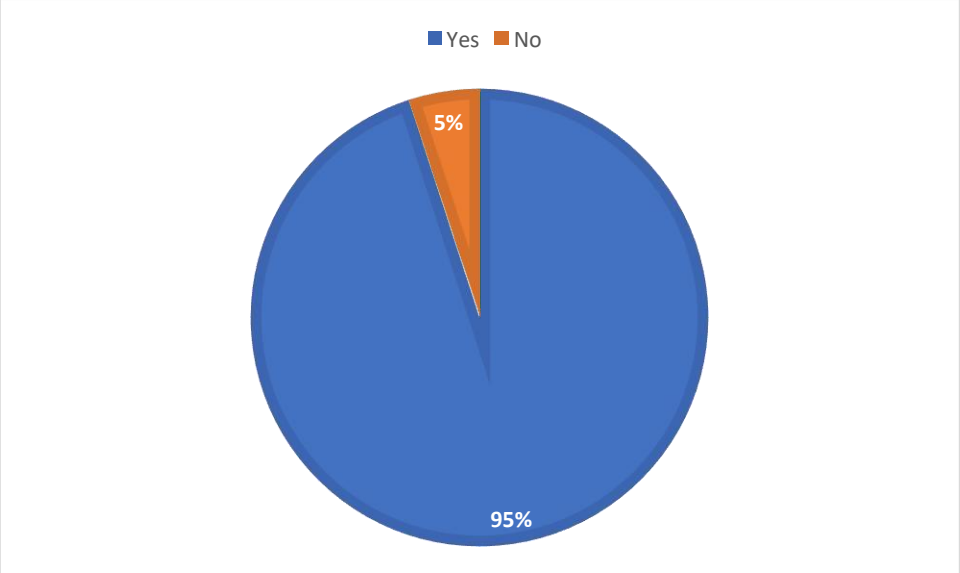

Fig 18: Medication

According to this survey, 95% of people took medication. 5% of people took no medication. just wash two or three times with water.

5.10. Types of drugs used for conjunctivitis

Types of drugs used for conjunctivitis	Participant's response in percentage
Ophthalmic drop	56%
Ophthalmic ointment	33%
Tablet	11%

Table 10: Types of drugs used for conjunctivitis

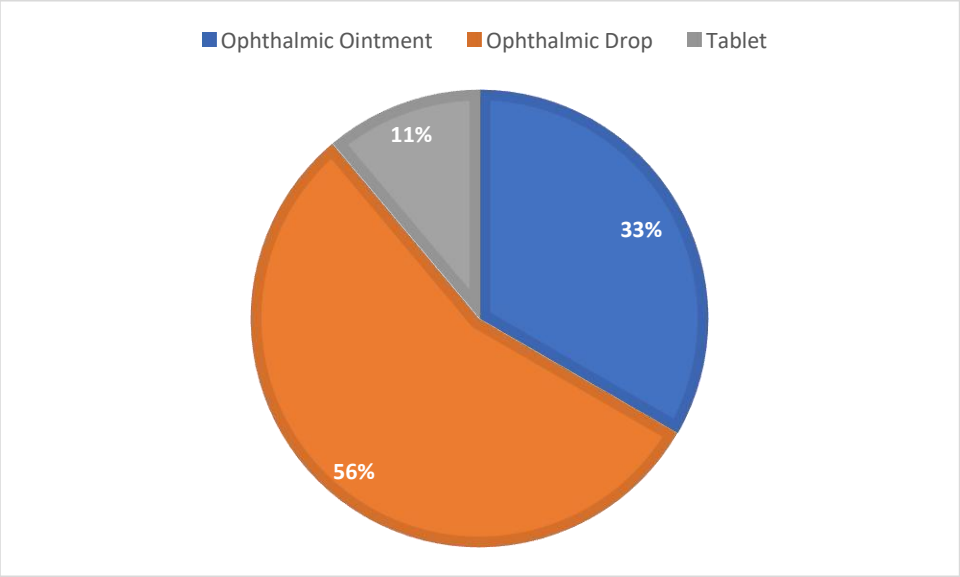

Fig 19: Types of drugs

In this survey, 56% of people were taking ophthalmic drop drugs. 33% took ophthalmic ointment. 11% took the tablet.

5.11. Conjunctivitis effects on Lifestyle

Conjunctivitis effects on Lifestyle	Participant's response in percentage
Yes	85%
No	15%

Table 11: Conjunctivitis effect on conjunctivitis

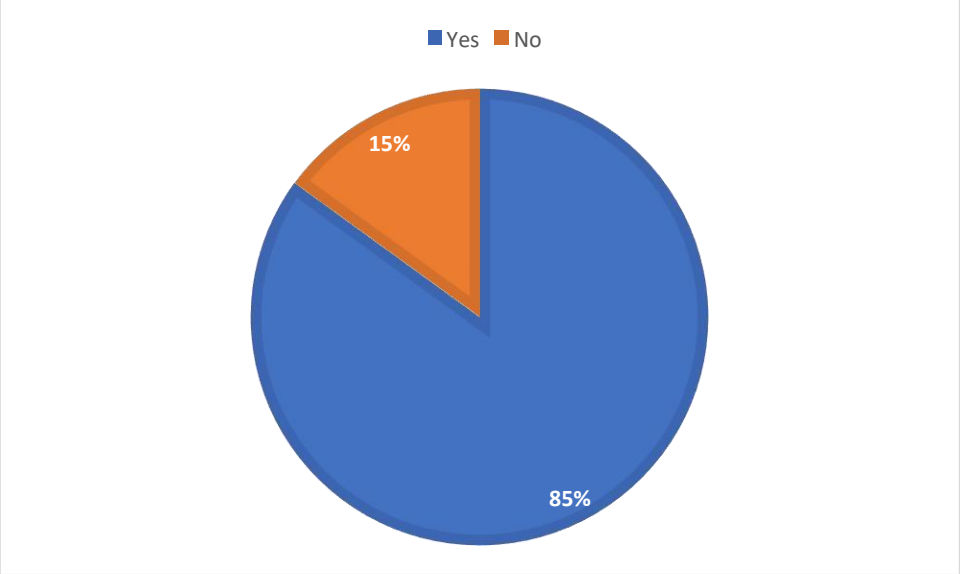

Fig 20: Lifestyle

In this survey, 85% of people said, conjunctivitis has an effect on lifestyle. 15% people said, it has no effect on lifestyle.

Conclusion

The transparent membrane (conjunctiva), which covers the eyelid and a piece of the eyeball, becomes inflamed or infected and is referred to as "pink eye" or conjunctivitis. When the conjunctiva is inflamed, the little blood vessels are more visible. Conjunctivitis affects millions of Bangladeshis at any given moment and can spread quickly from one person to another. This study was physically carried out at the National Institute of Ophthalmology & Hospital to learn about the current severity and management of conjunctivitis.

Reference

1. "Facts About Pink Eye". National Eye Institute. November 2015. Archived from the original on 9 March 2016. Retrieved 8 March 2016.
2. Long SS, Prober CG, Fischer M (2017). Principles and Practice of Pediatric Infectious Diseases E-Book. Elsevier Health Sciences. p. 502. ISBN 9780323461320.
3. Azari AA, Barney NP (October 2013). "Conjunctivitis: a systematic review of diagnosis and treatment". JAMA. 310 (16): 1721–9. doi:10.1001/jama.2013.280318. PMC 4049531. PMID 24150468.
4. "What is Viral Conjunctivitis a.k.a. Sore Eyes? | National Institutes of Health".
5. Jhanji V, Chan TC, Li EY, Agarwal K, Vajpayee RB (September–October 2015). "Adenoviral keratoconjunctivitis". Survey of Ophthalmology. 60 (5): 435–43. doi:10.1016/j.survophthal.2015.04.001. PMID 26077630.
6. Azari, A. A.; Barney, N. P. (2013). "Conjunctivitis: a systematic review of diagnosis and treatment". JAMA. 310 (16): 1721–1730. doi:10.1001/jama.2013.280318. PMC 4049531. PMID 24150468.
7. Bielory L, Friedlaender MH (February 2008). "Allergic conjunctivitis". Immunology and Allergy Clinics of North America. 28 (1): 43–58, vi. doi:10.1016/j.iac.2007.12.005. PMID 18282545. S2CID 34371872.
8. "Pink Eye (Conjunctivitis)". MedicineNet. Archived from the original on 22 June 2013.
9. "Acute Bacterial Conjunctivitis – Eye Disorders". Merck Manuals Professional Edition. Archived from the original on 28 December 2016. Retrieved 31 December 2016.
10. Hamborsky J, Kroger A, Wolfe C, eds. (2015). Epidemiology and Prevention of Vaccine-Preventable Diseases. U.S. Dept. of Health & Human Services, Centers for Disease Control and Prevention. p. 112. ISBN 978-0990449119.
11. Zentani A, Burslem J (December 2009). "Towards evidence-based emergency medicine: best BETs from the Manchester Royal Infirmary. BET 4: use of litmus paper in chemical eye injury". Emergency Medicine Journal. 26 (12): 887. doi:10.1136/emj.2009.086124. PMID 19934140. S2CID 38124735.
12. Hodge C, Lawless M (July 2008). "Ocular emergencies". Australian Family Physician. 37 (7): 506–9. PMID 18592066.

13. Fisher B, Harvey RP, Champe PC (2007). Lippincott's Illustrated Reviews: Microbiology (Lippincott's Illustrated Reviews Series). Hagerstown MD: Lippincott Williams & Wilkins. ISBN 978-0-7817-8215-9.
14. Høvding G (February 2008). "Acute bacterial conjunctivitis". Acta Ophthalmologica. 86 (1): 5–17. doi:10.1111/j.1600-0420.2007.01006.x. PMID 17970823. S2CID 20629824.
15. Singh MP, Ram J, Kumar A, Rungta T, Gupta A, Khurana J, Ratho RK (2018). "Molecular epidemiology of circulating human adenovirus types in acute conjunctivitis cases in Chandigarh, North India". Indian Journal of Medical Microbiology. 36 (1): 113–115. doi:10.4103/ijmm.ijmm_17_258. PMID 29735838.
16. Yanoff M, Duker JS (2008). Ophthalmology (3rd ed.). Edinburgh: Mosby. pp. 227–236. ISBN 978-0-323-05751-6.
17. Lévêque N, Huguet P, Norder H, Chomel JJ (April 2010). "[Enteroviruses responsible for acute hemorrhagic conjunctivitis]". Médecine et Maladies Infectieuses (in French). 40 (4): 212–8. doi:10.1016/j.medmal.2009.09.006. PMID 19836177.
18. CDC (2 October 2017). "Protect Yourself From Pink Eye". Centers for Disease Control and Prevention. Retrieved 7 December 2018.
19. "Allergic Conjunctivitis". familydoctor.org. Archived from the original on 6 September 2015. Retrieved 18 September 2015.
20. Brooks P (25 October 2012). The Daily Telegraph: Complete Guide to Allergies. ISBN 9781472103949. Retrieved 15 April 2014.
21. "What Is Allergic Conjunctivitis? What Causes Allergic Conjunctivitis?". medicalnewstoday.com. Archived from the original on 16 March 2010. Retrieved 6 April 2010.
22. Mourad MS, Rihan RA (April 2018). "Prevalence of Different Eye Diseases excluding Refractive Errors Presented at the Outpatient Clinic in Beheira Eye Hospital". The Egyptian Journal of Hospital Medicine. 71 (2): 2484–2489. doi:10.12816/0045645. S2CID 80882721.
23. Perkin MR, Bader T, Rudnicka AR, Strachan DP, Owen CG (24 November 2015). "Inter-Relationship between Rhinitis and Conjunctivitis in Allergic Rhinoconjunctivitis and Associated Risk Factors in Rural UK Children". PLOS ONE. 10 (11): e0143651.

Bibcode:2015PLoSO..1043651P. doi:10.1371/journal.pone.0143651. PMC 4658044. PMID 26600465.

24. Puéchal X, Terrier B, Mouthon L, Costedoat-Chalumeau N, Guillevin L, Le Jeunne C (March 2014). "Relapsing polychondritis". Joint, Bone, Spine. 81 (2): 118–24. doi:10.1016/j.jbspin.2014.01.001. PMID 24556284.
25. Cantarini L, Vitale A, Brizi MG, Caso F, Frediani B, Punzi L, et al. (2014). "Diagnosis and classification of relapsing polychondritis". Journal of Autoimmunity. 48–49: 53–9. doi:10.1016/j.jaut.2014.01.026. PMID 24461536
26. Mannis MJ, Macsai MS, Huntley AC (1996). Eye and skin disease. Lippincott-Raven. ISBN 9780781702690. Archived from the original on 5 July 2014. Retrieved 23 April 2014.
27. O'Gallagher M, Banteka M, Bunce C, Larkin F, Tuft S, Dahlmann-Noor A (May 2016). "Systemic treatment for blepharokeratoconjunctivitis in children". The Cochrane Database of Systematic Reviews. 2016 (5): CD011750. doi:10.1002/14651858.CD011750.pub2. PMC 9257284. PMID 27236587.
28. Longo DL (2012). "Disorders of the Eye(Horton JC)". Harrison's Principles of Internal Medicine. McGraw-Hill.
29. Epling J (2010). "Bacterial conjunctivitis". BMJ Clin Evid. 2010. PMC 2907624. PMID 21718563.
30. Cronau H, Kankanala RR, Mauger T (2010). "Diagnosis and management of red eye in primary care". Am Fam Physician. 81 (2): 137–44. PMID 20082509.
31. Gigliotti F, Williams WT, Hayden FG, Hendley JO, Benjamin J, Dickens M; et al. (1981). "Etiology of acute conjunctivitis in children". J Pediatr. 98 (4): 531–6. PMID 6970802.
32. Tagliaferri A, Love TE, Szczotka-Flynn LB (2014). "Risk factors for contact lens-induced papillary conjunctivitis associated with silicone hydrogel contact lens wear". Eye Contact Lens. 40 (3): 117–22. doi:10.1097/ICL.0000000000000019. PMC 4113198. PMID 24681609.
33. Gichuhi S, Bosire R, Mbori-Ngacha D, Gichuhi C, Wamalwa D, Maleche-Obimbo E; et al. (2009). "Risk factors for neonatal conjunctivitis in babies of HIV-1 infected mothers". Ophthalmic Epidemiol. 16 (6): 337–45. doi:10.3109/09286580903144746. PMC 3223245. PMID 19995198.

34. Zar HJ (2005). "Neonatal chlamydial infections: prevention and treatment". Paediatr Drugs. 7 (2): 103–10. PMID 15871630.
35. Nahmias AJ, Visintine AM, Caldwell DR, Wilson LA (1976). "Eye infections with herpes simplex viruses in neonates". Surv Ophthalmol. 21 (2): 100–5. PMID 982267.
36. Hsieh VC, Liu CC, Hsiao YC, Wu TN (2016). "Risk of Allergic Rhinitis, Allergic Conjunctivitis, and Eczema in Children Born to Mothers with Gum Inflammation during Pregnancy". PLoS One. 11 (5): e0156185. doi:10.1371/journal.pone.0156185. PMC 4880316. PMID 27224053.
37. Borish L (2003). "Allergic rhinitis: systemic inflammation and implications for management". J Allergy Clin Immunol. 112 (6): 1021–31.doi:10.1016/j.jaci.2003.09.015. PMID 14657851.
38. Gumus K, Cavanagh DH (2009). "The role of inflammation and antiinflammation therapies in keratoconjunctivitis sicca". Clin Ophthalmol. 3: 57–67. PMC 2709015. PMID 19668545.
39. Stern ME, Beuerman RW, Fox RI, Gao J, Mircheff AK, Pflugfelder SC (1998). "The pathology of dry eye: the interaction between the ocular surface and lacrimal glands". Cornea. 17 (6): 584–9. PMID 9820935.
40. Zhang X, Zhao L, Deng S, Sun X, Wang N (2016). "Dry Eye Syndrome in Patients with Diabetes Mellitus: Prevalence, Etiology, and Clinical Characteristics". J Ophthalmol. 2016: 8201053. doi:10.1155/2016/8201053. PMC 4861815. PMID 27213053.
41. Bielory L, Friedlaender MH (February 2008). "Allergic conjunctivitis". Immunol Allergy Clin North Am. 28 (1): 43–58, vi. doi:10.1016/j.iac.2007.12.005. PMID 18282545. S2CID 34371872.
42. Ono SJ, Abelson MB (January 2005). "Allergic conjunctivitis: update on pathophysiology and prospects for future treatment". J. Allergy Clin. Immunol. 115 (1): 118–22. doi:10.1016/j.jaci.2004.10.042. PMID 15637556.
43. Whitcup SM (2006). Cunningham ET Jr; Ng EWM (eds.). "Recent advances in ocular therapeutics". Int Ophthalmol Clin. 46 (4): 1–6. doi:10.1097/01.iio.0000212140.70051.33. PMID 17060786. S2CID 32853661.

44. Onofrey, Bruce E.; Skorin, Leonid; Holdeman, Nicky R. (2005-01-01). Ocular Therapeutics Handbook: A Clinical Manual. Lippincott Williams & Wilkins. ISBN 9780781748926. including virus, fungus, chlamydia, and nematodes.
45. Karakus, S. "Allergic Conjunctivitis". Johns Hopkins Medicine. Retrieved 10 July 2021.
46. "What is conjunctivitis?". patient.info. Archived from the original on 30 April 2010. Retrieved 2010-04-06.
47. By Melvin I. Roat, MD, FACS, Sidney Kimmel Medical College at Thomas Jefferson University Medically Reviewed Apr 2021 | Modified Sep 2022
48. Merck & Co, Inc., Rahway, NJ, USA (known as MSD outside the US and Canada)—dedicated to using leading-edge science to save and improve lives around the world. Learn more about the Merck Manuals and our commitment to Global Medical Knowledge.
49. MD, FACS, Sidney Kimmel Medical College at Thomas Jefferson University Medically Reviewed Apr 2021 | Modified Sep 2022
50. Melvin I. Roat, MD, FACS, Sidney Kimmel Medical College at Thomas Jefferson University Medically Reviewed Apr 2021 | Modified Sep 2022
51. "Protect Yourself From Pink Eye". Centers for Disease Control and Prevention. 2 October 2017. Retrieved 18 October 2017.
52. Isenberg SJ (2003). "The ocular application of povidone-iodine". Community Eye Health. 16 (46): 30–1. PMC 1705857. PMID 17491857.
53. Rose P (August 2007). "Management strategies for acute infective conjunctivitis in primary care: a systematic review". Expert Opinion on Pharmacotherapy. 8 (12): 1903–21. doi:10.1517/14656566.8.12.1903. PMID 17696792. S2CID 45899988.
54. Bartlett JD, Jaanus SD (2008). Clinical Ocular Pharmacology. Elsevier Health Sciences. pp. 454–. ISBN 978-0-7506-7576-5. Archived from the original on 3 December 2016.
55. Visscher KL, Hutnik CM, Thomas M (November 2009). "Evidence-based treatment of acute infective conjunctivitis: Breaking the cycle of antibiotic prescribing". Canadian Family Physician. 55 (11): 1071–5. PMC 2776793. PMID 19910590.
56. Sheikh A, Hurwitz B, van Schayck CP, McLean S, Nurmatov U (September 2012). "Antibiotics versus placebo for acute bacterial conjunctivitis". The Cochrane Database of

Systematic Reviews. 9 (9): CD001211. doi:10.1002/14651858.CD001211.pub3. PMID 22972049.

57. Isenberg SJ, Apt L, Valenton M, Del Signore M, Cubillan L, Labrador MA, et al. (November 2002). "A controlled trial of povidone-iodine to treat infectious conjunctivitis in children". American Journal of Ophthalmology. 134 (5): 681–8. doi:10.1016/S0002-9394(02)01701-4. PMID 12429243.