Review Article

Current Updated Review on Prevention and Management of Conjunctivitis: A Comparative Study of Herbal and Pharmaceutical Management

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ABSTRACT

Conjunctivitis is characterized by inflammation and swelling of the conjunctival tissue, accompanied by engorgement of the blood vessels, ocular discharge, and pain. There are numerous medicinal plants available in the world to prevent or cure diseases. An ophthalmic problem affects most of the population. Some of these can be treated with antibiotics and steroids but the prolonged use of these drugs has side effects. Many traditional herbal eye drops prepared from many medicinal plants combination, could cure ophthalmic disorders. This review briefly explains the comparative study of herbal drugs and pharmaceutical drugs used in treatment of conjunctivitis. At the present time the pharmaceutical treatment is most popular in market. The reason for its popularity is that in the present world of today the life has become so fast and tedious that only the pharmaceutical treatment suits to the public. The reason being prompt in action highly available easy to take continuous development.

Keywords: Conjunctivitis, Management, Preventions, Herbal Medicines, Pharmaceutical treatment.

INTRODUCTION

Conjunctivitis is the inflammation of conjunctiva characterized by swelling, congested blood vessels, watering and pain in eyes.[1] A single cause of this increase cannot be pinpointed and experts are therefore considering the contribution of numerous factors, including genetics, air pollution in urban areas, pets, and early childhood exposure.[2] Gram-positive bacteria such as Streptococcus pneumonia, Staphylococcus aureus, Corynebacterium usually cause milder conjunctivitis as compared to gram negative bacteria.[3] Ocular allergy can itself produce irritating symptoms and severe forms, such as atopic keratoconjunctivitis, could finally lead to visual loss. Milder cases of bacterial conjunctivitis are mostly benign and self-limited and need to be monitored regularly.[4] Such cases usually may not require any treatment or can be treated easily with antibiotics. Bacterial conjunctivitis due gram-negative bacteria such as Hemophilus influenza, Pseudomonas aeruginosa, Moraxella, Serratia marcescens, N. gonorrhoeae and C. trachomatis is usually virulent and cause severe infections and ocular perforation within 24-48 hours of infection.[5] Severe bacterial conjunctivitis may lead to blindness and cansignify a severe underlying systemic disease.[6]

Figure 1: Conjunctivitis

CLINICAL FEATURE OF CONJUNCTIVITIS

Patients usually complain of a gritty feeling in one or both eyes, itching or burning sensation in one or both eyes, excessive tearing, discharge from one or both eyes, swollen eyelids, pink discoloration to the whites of one or both eyes, increased sensitivity to light and blurry vision. Inflammation of the conjunctiva causes injection (dilation of conjunctival vessels) and in some cases chemosis (conjunctival edema). Discharge may be seen in viral, bacterial, or allergic conjunctivitis. Discharge varies from mild to severe in bacterial conjunctivitis, but usually appears purulent and persists throughout the day. Meibomian gland secretions in the medial canthus that accumulate during sleep and are not present during the day should not be confused with true discharge. Bacterial conjunctivitis is commonly classified according to its clinical presentation:

1. Hyperacute bacterial conjunctivitis presents with the rapid onset of conjunctival injection, eyelid edema, severe, continuous, and copious purulent discharge, chemosis, and discomfort or pain. *N gonorrhoeae* is a frequent cause of hyper acute conjunctivitis in sexually active patients; the patient usually also has *N gonorrhoeae* genital infection, which is often asymptomatic. *N gonorrhoeae* conjunctivitis also occurs in neonates, as noted above. The cornea is frequently involved, and untreated cases can progress within days to corneal perforation. Unlike most other types of conjunctivitis, gonococcal conjunctivitis should be treated as a systemic disease, with both systemic and topical antibacterial therapy.[7]

2. Acute bacterial conjunctivitis typically presents abruptly with red eye and purulent drainage without significant eye pain, discomfort, or photophobia. Visual acuity does not typically decrease unless large amounts of discharge intermittently obscure vision.
3. Chronic bacterial conjunctivitis, i.e, red eye with purulent discharge persisting for longer than a few weeks, is generally caused by *Chlamydia trachomatis*.[8]

TYPES OF CONJUNCTIVITIS

1. Allergic Conjunctivitis
2. Viral Conjunctivitis
3. Bacterial Conjunctivitis
4. Irritant and Chemical Conjunctivitis
5. Herpes Conjunctivitis
6. Giant papillary conjunctivitis
7. Keratoconjunctivitis

1. Allergic Conjunctivitis

It is commonly occurs in people who suffer from an allergic condition, allergic conjunctivitis can be caused by a number of substances particular to the individual. This type of conjunctivitis often has a seasonal element and occurs more frequently during spring and seasonal changes.[9]

Figure 2: Allergic Conjunctivitis

2. Viral Conjunctivitis

Viral conjunctivitis is caused by a virus, either contracted through the air or direct contact. Viruses that cause the common cold, acute respiratory infections, or disease such as measles or herpes are often the causes of viral conjunctivitis.[10]

Figure 3: Viral Conjunctivitis

3. Bacterial Conjunctivitis

Bacteria such as Staphylococcus, Streptococcus, and Haemophilus are the common culprits that cause this type of conjunctivitis which is highly contagious and easily spread, especially amongst children.[11]

Figure 4: Bacterial Conjunctivitis

4. Irritant and Chemical Conjunctivitis

Certain irritants to the eye such as flame burns, some plant saps, irritant gases or chemicals, and environmental toxins can all cause irritant conjunctivitis.[11]

Figure 5: Irritant Conjunctivitis

5. Herpes Conjunctivitis

A herpes infection is actually quite common, especially the herpes simplex virus, which causes cold sores on the lips and mouth area. Exposure to sun and high fevers are triggers for causing these cold sores.[12]

Figure 6: Herpes Conjunctivitis

6. Giant papillary conjunctivitis

Giant papillary conjunctivitis (GPC) is an inflammatory disease characterized by papillary hypertrophy of the superior tarsal conjunctiva; the appearance is similar to vernal conjunctivitis, but there is no significant corneal involvement. GPC is not an allergic disease; the incidence of systemic allergy in GPC patients is similar to that of the general population, and the stimuli for the papillary conjunctival changes are inert substances rather than allergens. For example, GPC may be caused by limbal sutures, contact lenses, ocular prostheses, and limbal dermoid. When these irritative stimuli are removed, the conjunctival papillary changes resolve. The conjunctival

tissues may contain mast cells, basophils, or eosinophils, but not to the extent of an allergic reaction. There is no increase in IgE or histamine in the tears of GPC patients. Since the advent of disposable contact lenses, the frequency of GPC is low.

Figure 7: Giant papillary conjunctivitis

7. Kerato-conjunctivitis

kerato-conjunctivitis is primarily affecting the superficial epithelium of conjunctiva and cornea simultaneously. It is characterized by a mixed follicular and papillary response of conjunctival tissue. It is still one of the leading causes of preventable blindness in the world. Trachoma is caused by a bedsonian organism, the Chlamydia trachomatis belonging to the Psittacosis lymphogranuloma trachoma (PLT) group. The organism is epitheliotropic and produces intra cytoplasmic inclusion bodies called Halberstaedter Prowazeke bodies. The symptoms include minimal and mild foreign body sensation in the eyes, occasional lacrimation, slight stickiness of the lids and scanty mucoid discharge in the absence of secondary infection. In the presence of secondary infection, a typical symptom of acute mucopurulent conjunctivitis develops.[13,14]

Figure 8: Kerato conjunctivitis

MANAGEMENT OF CONJUNCTIVITIS

Herbal medicines for management of conjunctivitis:

In medical system, it is a challenge to manage an eye disorders without any side effects by chemical drugs. But now a days it is little successful with the help of the herbal medicines. Therefore; efforts have been made to identify new medicinal plants from different sources because of their effectiveness, few side effects and low cost. Approximately in the world 200 plants have been identified to support the treatment for eye disorders and several plant species have been listed in Traditional Indian Medicine for their ophthalmic effects.

In the Ayurvedic system of medicine, ancient Indian books like CharakSamhita, Sushrut Samhita, Ras Tarang, Bhavprakasha, Nayan Drastam and Astanghriday, there are a number of plants which are used in ophthalmic disorders, either single or in compound formulations. In Ayurveda (Indian system of medicine) various eye disorders and diseases like Abhishyand (Conjunctivitis), Adhimanth (Glaucoma), Timir (Cataract), etc. have been described in great details. Their etiology and treatments have also been described. There are some reports which explains the medicinal plants used in the treatment for ocular disorders. Some reviews are recorded as common name, scientific name, family, part used and reference of plants used in the treatment of eye diseases.

1. Babul (*Acacia nilotica*):

The leaves of babul tree are effective in the treatment of conjunctivitis. The leaves, ground to paste, should be applied on the affected eyes at night, supported by a bandage which should be untied in the next morning. This removes pain and redness.

2. Rough chaff (*Achyranthus aspera*):

The root of the herb is useful for eye disorders. A paste of the roots with water can be applied beneficially in the opthalamia and opacity of the cornea.

3. Indian Barberry (*Berberis aristata*):

The drug is highly beneficial in the treatment of eye diseases. Mixed with milk, it can be used effectively as a lotion in conjunctivitis.

4. Tenner cassia (*Cassia auriculata*):

Finely powdered, decorticated seeds should be used as a dusting powder in the treatment of conjunctivitis. The seeds find their application in purulent opthalmia that is, inflammation of the eye or conjunctiva. They should be finely powdered and blown into the affected eyes. An ointment prepared from them and oil can be applied to the affected eye with confidence.

5. Pot Marigold (*Officinalis calendula*):

A cold infusion of the herbs used as an eye wash, gives relief in conjunctivitis. A lotion of flowers is also a useful wash for inflamed and sore eyes.

6. Coriandrum (*Coriender sativum*):

A decoction prepared from freshly dried coriander is an excellent eye wash in conjunctivitis. It relieves burning sensation and reduces pain and swelling.

7. *Ervatamia coronaria*:

The juice or the milk from the leaves, either by themselves or mixed with in inflammation of the eye. The juice of the flower mixed with same bland oil such as refined coconut charcoal of the plant, can be used with beneficial results as a soothing application oil can be used with grafting results for sore eyes and inflammation of the cornea.

8. *Petroselinum crispum*:

Raw parsley juice, mixed with carrot juice, is effective in all ailments connected with the eyes and the optic nerves. It is good for weak eyes, ulceration of cornea, cataracts and conjunctivitis.

9. Turmeric:

The decoction of turmeric is a very cooling application in conjunctivitis; you can either wash your eyes with this decoction or apply the compress made with decoction over the eyes.[15]

Table 1: Herbal/Traditional plant used for conjunctivitis

Sr.No.	Herbal Plant (Common Name)	Family	Part Used
01	*Abelmoschus esculentus*	Malvaceae	Fruit, flower
02	*Acacia arabica*	Mimosaceae	Bark
03	*Ageratum conyzoides*	Compositae	Leaf
04	*Albizia lebbeck*	Mimosaceae	Leaf, Bark
05	*Annickia chlorantha*	Annonaceae	Bark
06	*Azadirachta indica*	Meliaceae	Whole plant
07	*Boerhavia diffusa*	Nyctaginaceae	Leaf, root
08	*Borago officinalis*	Boraginaceae	Leaf, flower
09	*Ervatamia divaricata*	Apocynaceae	Whole plant
10	*Flacourtia indica*	Flacourtiaceae	Leaf
11	*Foeniculum vulgare*	Apiaceae	Leaf, flower
12	*Heliotropium indicum*	Boraginaceae	Leaf, root
13	*Iris germanica*	Iridaceae	Flower
14	*Juniperus procera*	Cupressaceae	Sap
15	*Lophira tanceotata*	Ochnaceae	Leaf
16	*Memecylon umbellatum*	Melastomataceae	Leaf, root
17	*Mimosa pudica*	Mimosae	Conjunctivitis
18	*Ocimum sanctum*	Labiatae	Whole plan
19	*Pelargonium graveolens*	Geraniaceae	Flower
20	*Rosa centifolia*	Rosaceae	Flower

PHARMACEUTICAL MANAGEMENT FOR CONJUNCTIVITIS:

Topical mast cell stabilizers: Mast cell stabilizers are recommended for use throughout a period of allergen exposure. E.g. Sodium cromoglycate is usually effective but the newer agents, lodoxamide and nedocromil, may be effective in those with an inadequate response to sodium cromoglycate.[16]

Topical ocular antihistamines: The topical ocular antihistamines, antazoline, azelastine, and emedastine provide rapid relief of the symptoms of allergic conjunctivitis. Azelastine seems to have additional mast cell stabilizing properties. Topical antihistamines are not appropriate for prolonged use (no longer than six weeks). Combined antihistamine/vasoconstrictor drops - eg, antazoline with xylometazoline. Diclofenac eye drops are also licensed for seasonal allergic conjunctivitis.[17]

Oral Antihistamines: Oral antihistamines such as loratadine or chlorphenamine may be used. Oral antihistamines provide relief of symptoms and are particularly useful when there is associated allergic rhinitis. They can cause drowsiness, particularly the older compounds such as chlorphenamine, and patients need to be cautioned regarding this.[18]

Topical corticosteroids: Topical corticosteroids eg, betnesol can be used if symptoms are very severe but there must be absolutely no doubt about the diagnosis. Remember the risks of infections, including undiagnosed corneal herpes simplex or ocular herpes zoster, and of secondary glaucoma. Topical corticosteroids should never be given for an undiagnosed red eye, when visual acuity is impaired, or if there is a history of ocular herpes simplex infection. Long-term use is avoided because this can result in cataract, glaucoma, and severe bacterial or fungal infections involving the eyelid, conjunctiva, and cornea. There may be a role for intranasal corticosteroids which have been shown to reduce ocular symptoms.

Oral steroids: Oral steroids in a short (five-day) course may be used in severe cases where there is no doubt about the diagnosis. Ophthalmologists may use them in severe cases.[19]

Topical Antibiotics: Bacterial conjunctivitis is usually treated with antibiotic eye drops or ointment that cover a broad range of bacteria. e.g. Trimethoprim with polymycin B, Gentamicin, Tobramycin, Neomycin, Ciprofloxacin, Ofloxacin, Gatifloxacin, Erythromycin. Povidone-iodine solution 1.25% ophthalmic solution may be a safe and viable alternative to topical antibiotics for treating bacterial conjunctivitis, especially in resource-poor countries, where antibiotics may be hard to come by and/or expensive. Like the common cold, there is no cure for viral conjunctivitis; however the symptoms can be relieved with cool compresses and artificial tears. For the worst cases, topical steroid drops may prescribe to reduce the discomfort from inflammation. Viral conjunctivitis usually resolves within 3 weeks. There are preparatory eye washes and lotions which may soothe the eyes and at least

one eye treatment which are for mild infections. The doctors may prescribe drops or ointments or both. Drops stay in the eye for a shorter time but ointment tends to blur the vision. Sometimes the doctor may prescribe drops by day with ointment at night.[20]

PREVENTIONS OF CONJUNCTIVITIS

Prevention of infective conjunctivitis relies primarily on good personal hygiene.

Bacterial conjunctivitis is uncommon but can be spread by the hands or from upper respiratory tract infections. Gonnococcal infection is transmitted from the genital tract or urine to the eye by hands. This is a serious breach of normal hygiene.

Viral conjunctivitis, in particular adenovirus, can sweep through a community or an institution such as a school very quickly. This is highly infectious and needs to be controlled by the enforcement of strict hygiene standards towels, face cloths, hands and applanation tonometers are some examples of how this can easily be transmitted.

Prevention of allergic conjunctivitis is not possible unless the patient is able to change his or her environment or job or identify the allergen causing the allergy and remove it, e.g., pollen, animal fur. Drugs can cause an allergy that is reversed by stopping the drug. Atropine, neomycin and eye drop preservatives are particularly common causes of such drug reactions.

PATIENT EDUCATION

Patient education is the most important aspect in prevention of bacterial conjunctivitis, patient education should include good hygiene (e.g., washing hands thoroughly and frequently with soap and water or alcohol rub) and avoidance of touching the eyes, especially after exposure to infectious people. Patient must be made understand that practicing good hygiene is the best way to control the spread of conjunctivitis. Patients should be advised to discard eye cosmetics, particularly mascara and not to anyone else's eye cosmetics or personal eye-care items. Patients with bacterial conjunctivitis who wear contact lenses should be instructed to temporarily stop wearing their lenses while the condition is active. An ophthalmologist can guide the patient if this is necessary. If one develops conjunctivitis due to wearing contact lenses, ophthalmologist may recommend switching to a different type of contact lens or disinfection solution. An ophthalmologist might recommend changing contact lens prescription to a lens that one can replace more frequently. This will help in the prevention of conjunctivitis from recurring. Patients suffering from bacterial conjunctivitis should be advised not to touch their eyes with hands. In order to prevent the transmission of the disease it is very important to educate patients about their infectious nature and the importance of finishing their antibiotic regimen. Patients should also change their towel and wash cloth daily and should not share them with others. Patients must follow their ophthalmologist's instructions on proper contact lens care.

CONCLUSION

As a conclusive remark, we affirm that ayurveda possess a useful approach, quality procedure and abundant reserve of herbal drug which can be employed in the management of conjunctivitis. Ayurvedic drug used in this treatment are easily available. This overall regimen did not cause any unwanted effects. At the present time the pharmaceutical treatment is most popular in market. The reason for its popularity is that in the present world of today the life has become so fast and tedious that only the pharmaceutical treatment suits to the public. The reason being prompt in action highly available easy to take continuous development. Although it matches with the current environment but it leaves its long lasting impact in the form of critical side effect.

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