

**Original Article**

# Frequency of Conjunctivitis among Farmers of District Vehari, Punjab, Pakistan

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**Abstract:**

Conjunctivitis is a globally prevalent ocular and/eye infection. The basic motivation of the current study may be traced back to the association of conjunctivitis with unhygienic situations and sunlight exposure. The daily routine of farmers, overwhelming poverty, and illiteracy ratio may have further enhanced the incidence ratio of conjunctivitis. The ocular infection and/or conjunctivitis is caused by various pathogens, if not managed properly and appropriately may lead to corneal perforation or blindness.

**Objective:** The study has been designed to find out the prevalence of various pathogenic and allergic conjunctivitis among farmers in the district Vehari, Punjab, Pakistan. **Methods:** It was a community-based and cross-sectional descriptive study from October– November 2019. The study involved the quantitative analytical method. Anterior segments of eyes followed by posterior segments were examined by using an ophthalmoscope and torchlight for the diagnosis of conjunctivitis. Data on pathogenic and allergic conjunctiva was collected. **Result:** Our study indicated that 33(16.5%) farmers were found with the symptoms ascertained with conjunctivitis. Among the studied subjects, 29(14.5%) and 4(2%) farmers were found with bacterial and viral conjunctivitis, respectively. As far as the tendency of seeking medical help and ophthalmic consultation is concerned, 31(15.5%) and 19(9.5%) patients preferred to get examined by an eye specialist and traditional treatment, respectively. However, 150(75%) patients neglected to seek any medical aid. It was found 27 (13.5%), and 55 (27.5%) farmers were using glasses and traditional eye protective measures, respectively. However, almost sixty percent 118(59%) of farmers were not using any type of eye-protective measures. It was found that 59%, 30%, and 11% farmer population was exposed to sunlight for almost six, four, and two hours, respectively on daily basis. **Conclusions:** The use of prevalent traditional protective measures and lack of treatment or medical aid seeking trend by farmers has been found responsible for the high incidence of bacterial conjunctivitis. Moreover, long working hours and sunlight exposure along with the predominant unhygienic conditions may further quadruple the frequency of viral and bacterial conjunctivitis. The high prevalence ratio of conjunctivitis, eye infections, and ocular injuries highlight the need of observing universal eye safety and precautionary measures. Keeping in view the downtrodden economic conditions of the farmers and agriculturalists in the country and the financial repercussions associated with the infection, a state-owned medical awareness and relief process must be ensured and encouraged for the Pakistani community.

**Keywords:** Conjunctivitis, Farmers, Viral Conjunctiva, Bacterial conjunctivitis, Ocular Infection

**Introduction:**

Conjunctivitis is a globally prevalent ocular infection [1]. Unhygienic intake of water or food and compromised personal hygiene have been

found associated with the frequent prevalence of allergic conjunctivitis and ocular infection [5, 13, 37]. Lack of preventive and protective measures

may further accelerate the prevalence of ocular infections and conjunctivitis. Unhygienic conditions have also been found promoting the incidence of eye and/or ocular infections etc. among the general populace [5, 35,13]. Among various types of conjunctivitis, some are caused by viruses, bacteria, chlamydia, and other micro-pathogens [5]. Viral conjunctivitis is one of the most common types of infective conjunctivitis [2]. Conjunctival pathogens responsible for the infection may include *Chlamydia trachomatis* and *Staphylococcus aureus* [36]. The adenovirus has been found responsible for the occurrence of viral ocular infection among fifty to seventy percent of cases [3]. Symptomatic conditions of viral conjunctivitis may include redness, swelling, irritation, and shedding of tears. The symptomatic condition may prolong for at least one to two weeks [4].

Bacterial conjunctivitis is caused by bacterial pathogens like *Staphylococcus aureus*, *Streptococcus pneumoniae* and *haemophilus influenzae* [5, 7]. The predominant clinical symptoms of bacterial conjunctivitis may involve mucopurulent ocular discharge, watering, pain, chemosis, and swelling of the conjunctiva. However, the occasional infection can also be associated with low-grade fever, coughing, mucopurulent and rhinorrheal discharge [8]. Both gram-positive (52.5%) and gram-negative (47.8%) bacteria have been found associated with the high prevalence of bacterial conjunctivitis pathogens [9]. The majority of bacterial conjunctivitis cases (70%) were reported as self-healing, by various studies, within the short span of eight days. However, proper treatment coupled with the intake of recommended antibiotics may fasten the recovery process [10, 11].

It has been found that almost forty percent (40%) of the general populace suffer from allergic conjunctivitis [12-14]. Conjunctiva may further get hypersensitive to airborne pollens, animal dander, and other environmental factors which may contribute to the allergic response of conjunctiva [15]. Allergic conjunctivitis can be

classified as seasonal allergic conjunctivitis (SAC), perennial allergic conjunctivitis (PAC), vernal keratoconjunctivitis (VKC), and atopic keratoconjunctivitis (AKC) [16]. Some forms of ocular allergy have also been associated with contact lenses and ocular prosthesis [17]. It has been found that almost 15% to 20% population was affected by seasonal and perennial allergy [18]. To suppress the acute allergic inflammatory response of conjunctiva, the use of various anti-allergic agents like anti-histamine and/or mast cell stabilizers has been found effective [19-21]. However, if the use of anti-allergics fails to cure allergic conjunctivitis, for instance, in extremely severe situations, then the use of non-steroidal anti-inflammatory (NSAID) and corticosteroid agents may be found effective [22-27].

Farmers constitute two-third of Pakistan's population and have been found to contribute 20% of Pakistan's GDP. The basic motivation of the current study came from the association of ocular infection with sunlight exposure and/or working hours coupled with the overwhelming illiteracy and poverty rates in Pakistan which may obstruct the use of preventive and protective measures (i.e. wearing eye-protectors, eye-shields, glasses, etc.) against the ocular infections, injuries, and conjunctivitis by the general populace. The study has been, thus, designed to determine the prevalence of conjunctivitis i.e. viral, bacterial, and allergic conjunctivitis, the preventive use of wearing eye-protectors, and the trend of seeking medical aid among the farmers, considering them more prone to the above-mentioned situations.

### Methods:

A descriptive cross-sectional study was conducted about the prevalence of conjunctivitis in farmers in district Vehari, Punjab, Pakistan. The current cross-sectional study was carried out during October- November 2019. Data was collected in the way that the total number of villages in a Union Council was seven. A total number of thirty farmers were selected from each cluster. This led to the total number of farmers to one hundred and eighty. This may

finally account for two hundred subjects by the addition of ten percent biases. The whole procedure for the selection of respondents is as follows: Total villages in UC = 7, 1 cluster from each village = 6, 1 cluster = 30 farmers,  $6 \times 30 = 180$ , 10% added for Biases = 198 rounded off 200.

Non-probability convenient sampling technique was applied. Random selection of villages was followed by door to door communication approach. The farmers were examined after seeking the proper ethical permission. Anterior segments of their eyes were examined by using an ophthalmoscope and torchlight to diagnose conjunctivitis. It was followed by a comprehensive posterior eye segments examination. Data was collected on the incidence of various pathogenic conjunctivitis i.e. viral, bacterial, and allergic, the prevalent method of protective and/or preventive measures, and preference of subjects for seeking treatment or medical aid.

Diagnosis of allergic conjunctivitis was achieved by the presence of symptoms like burning sensation, bilateral itchiness, clear and/or ropy mucinous discharge, tearing, and photophobia. However, the presence of any two symptoms like redness, papillae, chemosis, brownish hyperpigmentation, and tranta spots on the limbal region was hinged on as the ocular signs [32, 33]. Data collection was followed by analysis of data using SPSS version 22.0.

## Results:

During October–November 2019, a total of two hundred farmers were examined for the presence of conjunctivitis (i.e. viral, bacterial) and/or allergic conjunctivitis. The study was conducted in the district of Vehari, Punjab, Pakistan. Our study indicated that 33(16.5%) farmers were found with the symptoms ascertained with conjunctivitis. Among the studied subjects, 29(14.5%) and 4(2%) farmers were found with bacterial and viral conjunctivitis, respectively. However, no farmer was found to develop any symptoms hinged on allergic conjunctivitis. Keeping in view the former findings as reported by other studies, the high

prevalence of allergic conjunctivitis among teenagers and children [31–32, 38–39] may be linked with the current no prevalence of allergic conjunctivitis among old-aged farmers. This finding may be traced back to the increasing ages of the subjects.

The current prevalence ratio of conjunctivitis among farmers speaks volumes for the need for eye-protectors among farmers during their exposure to sunlight. The previous studies have confirmed the need of wearing eye protectors to prevent the incidence of eye diseases. The regular use of eye-protectors, eye shields, and safety glasses have been found significant to protect the subjects from the high incidence of ocular injuries and conjunctivitis. Our study found 27 (13.5%) and 55 (27.5%) farmers were using glasses and traditional eye protective measures, respectively. However, almost sixty percent 118(59%) of farmers were not using any type of eye-protective measures. It was found that 59%, 30%, and 11% farmer population was exposed to sunlight for almost six, four, and two hours on daily basis.

Bacterial conjunctivitis has been found as one of the predominant types of ocular infection. Out of total cases diagnosed with conjunctivitis 33(16.5%), the majority of farmers 29(14.5%) were diagnosed with the symptoms ascertained with bacterial conjunctivitis. It may be caused by bacterial pathogens like *Staphylococcus aureus*, *Streptococcus pneumoniae* and *Haemophilus influenzae* [5, 7]. Both gram-positive (52.5%) and gram-negative (47.8%) bacteria have been found associated with the high prevalence of bacterial conjunctivitis pathogens [9]. Few bacteria cultures of *Candida albicans* have also been reported to grow from the adenovirus samples 44(15%) of conjunctivitis [34].

A common trend of not seeking any medical aid and/or ophthalmic consultation has been found prevalent among the subjects of the present study. The use of unhygienic means and practices may also contribute to the prevalence

of pathogenic conjunctivitis among farmers. For instance, it has been observed by our study that a common practice of using personal cloths for cleaning the face and eyes may have further contributed to the spread of ocular infections. As far as the tendency of seeking medical help and ophthalmic consultation is concerned, 31(15.5%) and 19(9.5%) patients preferred to get examined by an eye specialist and traditional treatment, respectively. However, 150(75%) patients neglected to seek any medical aid. A common trend was found prevailing among the masses about considering the ophthalmic consultation and ocular treatment of no use. Some Karachi-based studies have brought forward the fact that bacteria cultures grown from most of the ocular infections and conjunctiva were found antibiotic-resistant [34]. This is most probably due to the inappropriate and inadequate self-medication of various antibiotics by the population under study.

Conjunctivitis	Frequency	Percentage
None	167	83.5%
Viral	4	2%
Bacterial	29	14.5%
Allergic	0	0%
<b>Total</b>	<b>200</b>	<b>100%</b>

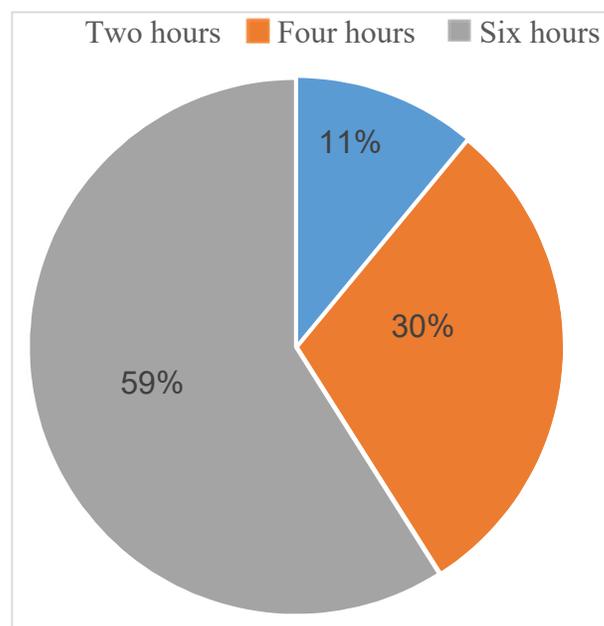
**Table 1:** Prevalent Frequency and Percentage of Conjunctivitis

Protective Measure	Frequency	Percentage
None	118	59%
Glasses	27	13.5%
Traditional	55	27.5%
<b>Total</b>	<b>200</b>	<b>100%</b>

**Table 2:** Frequency of wearing/using Eye Protectors against Conjunctivitis

Eye-Treatment Practices	Frequency	Percentage
Traditional	19	9.5%
Eye specialist	31	15.5%
None	150	75%
<b>Total</b>	<b>200</b>	<b>100%</b>

**Table 3:** Frequency of Ocular and/or Eye Treatment amongst the farmers



**Figure 1:** Percentile Representation of Sunlight Exposure by Farmers

## Discussion:

The incidence of conjunctivitis (bacterial or viral), ocular injuries, and/or eye infections among dentists has been reportedly reduced 205(3.9%) by wearing eye protection [36]. The high prevalence ratio of conjunctivitis, eye infections, and ocular injuries highlight the need of observing universal eye safety and precautionary measures. Female dentists were found with a high percentage of wearing eye protectors (65%) i.e. eye shields and safety glasses as compared to the male dentists (56%) [35]. Regular users of eye protectors were found with a low prevalence of conjunctivitis (14.3%) and foreign particles (38%) as compared to the incidence of conjunctivitis and foreign particles in 85.7% and 61.3% dentists with irregular use of eye-protectors ophthalmologist [35]. These finding of wearing eye protectors to reduce the incidence of conjunctivitis is in correspondence with the current findings of using glasses and traditional protective measures by 27 (13.5%) and 55 (27.5%) farmers, respectively.

It has also been reported by various studies that irregular wearers of eye protectors (70%) were found with a high incidence of ocular injuries as

compared to the regular wearers (30 %). Studies have found that 35.6% and 9.6% of subjects experiencing conjunctivitis and foreign particles visited an ophthalmologist [35]. The reported high percentage of the irregular user of eye protectors against ocular and conjunctivitis is in correspondence with the current findings of sixty percent 118(59%) farmers who were found neglecting the use of any eye-protective measures. However, a respective percentage of 59%, 30%, and 11% farmers were reportedly found exposed to sunlight for almost six, four, and two hours, respectively on daily basis. It is evident from the study that almost sixty (62.6%) and forty percent (42%) of dentists were informed to suffer from the incidence of foreign particles in their eyes and conjunctivitis. Whereas, almost forty percent (35.8%) and fifty (51%) and of total respondents suffered from episodes of conjunctivitis and foreign particles in their eyes [35].

Few previous studies have been found reporting 2826(11.10%) and 484(1.90%) patients with conjunctivitis and vernal conjunctivitis [29]. This incidence score of conjunctivitis is in line with the prevalence percentage of conjunctivitis 33(16.5%) in farmers by our study. Moreover, a low percentage of viral conjunctivitis 4(2%) in farmers, as diagnosed by our study, is in contrast to the 2968(90%) reported cases of viral conjunctivitis by another study [30]. Keeping in view the contagiousness of the disease, the diagnosed cases of viral conjunctivitis 4(2%) from our study were informed to get isolated from the rest of the family members till recovery and focus more on the preventive measure along with symptomatic treatment.

It has been evident that among the studied subjects, 29(14.5%) farmers were found with bacterial conjunctivitis. This is in comparison with the findings of another study, in which 71(18.3%) cases of bacterial conjunctivitis were diagnosed in the Karachi-based urban population. However, the study also concluded some conjunctiva cases caused by adenovirus

291(75%), herpes simplex 9 (2.3%) and *Chlamydia trachomatis* 7(1%)[34].

Our findings are in comparison to another study which found 238 and 213 cases of infective and bacterial conjunctivitis were diagnosed among the students[31]. Moreover, another study found 19.2% of patients suffering from allergic conjunctivitis, which found a significant ratio of teenagers suffering from allergic conjunctivitis [32]. It has been reported by some other studies that the frequency of eye diseases like conjunctivitis, vernal kerato-conjunctivitis, nasolacrimal duct blockage, hyper-metropia, and myopia was found prevalent among 77(41.3%), 30 (16.1%), 48 (25.8%), 17 (9.1%) and 14 (7.5%) children, respectively [39]. The low prevalence of allergic conjunctivitis among aged people as found by our study, is thus, in line with our findings of non-prevalence of allergic conjunctivitis among old-aged farmers. The high prevalence of respective conjunctiva and allergic conjunctivitis has also been confirmed up to 42.5% and 39.9 % among children by the findings of another study [38, 40].

### Conclusions:

It is concluded that the high prevalence of bacterial conjunctivitis may be traced to the untiring or long working hours in the fields and the use of traditional unhygienic protective measures against their sunlight exposure by the farmers of district Vehari, Punjab, Pakistan. This has been further quadrupled by their ignorance toward seeking any medical aid and/or ophthalmic consultation regarding the symptomatic treatment of any ocular infection and conjunctivitis. Hence, the regular use of eye protectors and various preventive practices must be motivated and appreciated as positive behavioral changes among these farmers. Keeping in view the downtrodden situations of farmers in the country and the financial implication of the infection, a state-owned medical relief process must be encouraged, which may ensure ocular injuries, infections and/or incidence of conjunctivitis among farmers, must be reported, registered, and

treated free of cost at all medical facilities available around the country.

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