https://africanjournalofbiomedicalresearch.com/index.php/AJBR
Afr. J. Biomed. Res. Vol. 28(1s) (January 2025); 808-813
Research Article

Prevalence of COVID19 in Conjunctivitis patients attended ophthalmic department Balad General Hospital

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Abstract

Background: COVID19 is a disease result from the infection by SARS-COV2virus that was first discovered in china \Wuhan- City, in 12\ 2019. COVID19, Previously recognized as respiratory sickness caused by the 2019 Novel Coronavirus (2019-nCOV) was formally announced in February via the World Health Organization (WHO). **Aim**: to determine the prevalence of COVID19 in conjunctivitis patients attended ophthalmic department, balad general hospital. **Patients and methods:** All patients attended general balad hospital ophthalmic department between june2021 and Jan 2022 randomly examined. This cross sectional study contain of 343 conjunctivitis patients, 35 patients with the diagnosis of COVID19 conjunctivitis were identified prevalence of COVID 19 conjunctivitis of conjunctivitis patients10.2%(95% confidence interval (1.4to1.9) . Visual acuity testing also an exterior inspection, slit-lamp bio microscopy, and diagnostic testing are the four important parts of the initial eye examination for individuals with conjunctivitis. By inspection in a well-lit room with special notes to: skin, local lymphadenopathy (especially preauricular), anomalies of the eyelids and adnexa (swelling, discolouration, malposition), and conjunctival discharge. By using slit-lamp bio microscopy with special notes to: Eyelid margin "inflammation, ulceration, discharge, nodules or vesicles, keratinization" lashes on the eyes (nits, lice, crusting, scurf), Canaliculi and lacrimal puncta (pouting, discharge) tarsal and forniceal conjunctiva (appearance and volume of papillae, cysts; cicatricle shifts, involving symblepharon and foreshortening; membranes and pseudo membranes; inflammation; hemorrhages; foreign particles; granulomas); cicatricle shifts, including foreshortening and symblepharon; membranes and pseudo membranes; ulceration Conjunctiva/limbus of the bulbar conjunctiva, (vascular injection [hyperemia], (follicles, masses, chemosis, cysts, papillae, ulcers, scars, phlyctenules, hemorrhages, foreign particles, keratinization), Cornea is a type of corneum "epithelial erosions; punctate and dendritic epithelial keratitis; filaments; ulceration; infiltration, including sub epithelial infiltrates and phlyctenules; vascularization; keratic precipitates". Frontal Chamber: (Iris (inflammatory response, involving synechiae and Trans illumination deficiencies). COVID19-like symptoms, occupational risks, contact with affected patients and recent travel were all reasons for people to be tested for conjunctivitis.

The most common laboratory tests used to identify COVID19-conjunctivitis are serology and RT-PCR. Before a patient to be considered safe, he must have two consecutive negative RT-PCR test results. A particular but less sensitive approach is "RT-PCR" in the diagnosis of COVID conjunctivitis. **RESULT:** prevalence of COVID 19 in our study related to conjunctivitis patients was: 10.2 %(95% interval of confidence) [CI]:(1.4to1.9). 23 male(65.7%) and 12 female (34.3%) presented with age group between 45years to 76 years. 35 COVID19 conjunctivitis ,the unilateral cases were 25 (71.4%) compare to bilateral cases were 10(28.6%). The severity of COVID 19conjunctivitis, moderate 18 cases (51.4%), compare to mild 9cases (25.7%) and severe 5 cases (14.3%), only 7cases (20%) need admission to hospital compare to non-hospitalized 28 cases (80%) preauricular lymphadenopathy was the most common associated finding with COVID19 conjunctivitis 18 cases (51.4%), followed by hemorrhagic conjunctivitis 5 cases (14.3%), and lid swelling 3 cases (8.6%), while dacryoadenitis /preseptal cellulitis and pseudomembranous conjunctivitis only one case each (2.9%)**.** The posterior segment finding after dilated fundus exam, only two cases (5.7%) presented with blurred vision due to optic neuritis/acute retinal necrosis. **Conclusion:** The study's objective was to determine the COVID19 prevalence rate, in conjunctivitis cases in order to avoid underestimating COVID19 prevalence in a region with stringent regulations and a scarcity of ophthalmological consultations. It's possible that conjunctivitis is the first sign of viral infection. It may have a distinct clinical appearance or be linked to other ocular findings involving the anterior or posterior segments of the eye.

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Received: 02/01/2025 Accepted:12/01/2025

DOI: https://doi.org/10.53555/AJBR.v28i1S.6237

Introduction

COVID19 is a virus infection generated by the SARS-COV-2 virus, which was originally discovered in Wuhan, Hubei Province, China, in December\ 2019.. COVID19, The World Health Organization (WHO) formally announced the 2019 Novel Coronavirus (2019-nCOV) respiratory disease in February. [1]

Human-to-human transmission via drops and close communication with mucosal surfaces such as the eyes, nasal, and oral cavity is causing the present widespread outbreak. [2] Beta coronavirus, a member of the Coronaviridae family, is the causative agent. It's a single-stranded RNA virus with a close resemblance to the coronavirus, which causes severe acute respiratory syndrome. [1,2,3]

Acute respiratory distress syndrome (SARDS) is a severe form of acute respiratory distress The coronavirus that causes severe acute respiratory syndrome is known as coronavirus. 2. (SARS-CoV-2). SARS-CoV-2 strains are categorized into two types based on phylogenetic analysis: type L and type S. There are around 100 strains of SARS-CoV-2. [3] SARS-receptor-binding CoV-2's region is identical to that of SARS-CoV. To enter the cell, the virus uses the angiotensin-converting enzyme 2 receptor (ACE2). The conjunctiva and cornea both had ACE2 receptors, however the number of receptors in ocular tissues was smaller. [2,6]

Severe systemic disease is caused by aging, living in a congested location, chronic lung diseases, comorbidities such as "immunocompromised states, diabetes, obesity, chronic renal, and liver diseases, and comorbidities such as diabetes, obesity, chronic renal, and liver diseases"[4] Furthermore, health-care personnel are more likely to become infected with the virus. Direct contact with a person who has COVID is a risk factor for COVID 19 related conjunctivitis. This suggested that the virus could be transmitted through the eyes.

COVID-19 has a 14-day incubation period, with peak numbers appearing four to five days after exposure.Viruses can spread by droplets, contact with infected surfaces, infected people's mucosal membranes, and the oro-fecal pathway. [3,5] The virus sheds for 20 days on average, with a maximum of 37 days. SARS-CoV-2 had an average incubation time of 5 to 7 days. according to another study, Patients were frequently contagious for several days before symptoms appeared. Within 11.5 days of exposure, almost 97 percent of patients experience symptoms. The 14-day quarantine suggestion was backed up by this. [5].

In samples taken from the places of COVID 19 patients brought to the hospital, viral RNA was recently identified, confirming that the virus was disseminated through direct contact with infected surfaces. Directly colonization of the ocular tissues with droplets from an infected patient, from the nasopharynx via the nasolacrimal duct, or from the lacrimal glands can all induce conjunctival infection. [1,7]

Conjunctivitis, or inflammatory of the conjunctiva, is a broad term that encompasses a wide range of diseases and conditions that primarily affect the conjunctiva. Although most forms of conjunctivitis are self-limiting, others can worsen and lead to significant ocular and extraocular problems. Some types of conjunctivitis, such as superior limbic kerato-conjunctivitis and ligneous conjunctivitis have an unclear cause. [8] Infectious or noninfectious conjunctivitis can be characterized as acute, chronic, or recurring. Infectious conjunctivitis is caused by viruses, bacteria, and Chlamydia. The following are some of the causes of noninfectious conjunctivitis: "Hay fever, atopy, vernal allergy, contact hypersensitivity, contact lens solution reaction/medication allergy, ocular cicatricial pemphigoid", and "Stevens-Johnson syndrome" are examples of allergies and immunity. Irritants /causes mechanical "Eyelashes, contact lenses, foreign substances, self-inflicted irritation, and floppy eyelid syndrome are all examples of self-inflicted irritation" [6] Neoplasia Toxic substances/chemicals (e.g., medicament's and personal care products) It's crucial to distinguish between conjunctival inflammation that occurs as a result of systemic or ocular disorders and conjunctival irritation that occurs as a result of systemic or ocular diseases; Dry eye and blepharitis, for example, frequently produce conjunctival irritation, although care for each of these conditions focuses on addressing the underlying issues. 1,2 Conjunctivitis can be caused by systemic infections like gonorrhea or atopy, and treatment for conjunctivitis should include treatment for the systemic condition.[9,10]. The most common kinds of conjunctivitis are the subject of this Preferred Practice Pattern., as well as those that are particularly difficult to detect and treat: Seasonal allergic conjunctivitis is a type of allergic conjunctivitis that occurs during the (SAC) Conjunctivitis of the vernal period Atopic conjunctivitis is a type of allergic conjunctivitis. Giant papillary conjunctivitis is a type of conjunctivitis that affects the eyes (GPC) Ocular cicatricial pemphigoid is a type of cicatricial pemphigoid that affects the (OCP), Adenoviral conjunctivitis is a conjunctivitis caused by an adenovirus Conjunctivitis caused by the herpes simplex virus (HSV). Bacterial Conjunctivitis is a conjunctivitis caused by bacteria. Conjunctivitis caused by Chlamydia Neoplastic Conjunctivitis is a kind of conjunctivitis that is caused by Conjunctivitis caused by medication.[5]

Severe acute respiratory conjunctivitis pathogenesis is largely unknown. In the SARS-CoV model, however, the infection is divided into three periods: Replication of viruses, hyperactivity of the immune system, and tissue degradation. Conjunctival cells, like lung tissue, perish from viral-mediated lysis or immunological reactions. The virus is released into tears as a result of cell death[11,12]

It was also underlined that the virus is transmitted through tears. Although it appears that coronavirus transmit through tears by limit level, it can persist in the conjunctiva even if there are no symptoms of conjunctivitis, highlighting the significance of To avoid infection from external droplets and aerosols, wear eye protection.[13,15] the receptors of Angiotensin-converting-enzyme-2 ACE2 and the TMPRSS2- protein are two important components to consider when studying the "Ocular Pathway." Conjunctivitis has been identified in COVID-19 patients, both adults and children. [7,10,12]

Patients and methods:

All patients attended general balad hospital ophthalmic department between june2021 and jan 2022 randomly examined. This study used a cross-sectional design included 343 conjunctivitis patients in this cross sectional study, 35 patients with the diagnosis of COVID19 conjunctivitis were identified.

Conjunctivitis, or irritation of the sclera, is a broad term that refers to a variety of conditions. and conditions that primarily affect the conjunctiva. Clinical features of conjunctivitis including itching, tear in, discomfort, photophopia, redness, edema, lid swelling, and discharge.

Mild conjunctivitis including occasional itching, tearing with sensation of fullness of conjunctival sac, mild discomfort, mild photophopia, mild redness and edema, small amount of discharge.

Moderate conjunctivitis including frequent itching, infrequent spilling of tears over the lid margine, moderate discomfort, moderate photophopia necessitating dark glasses, moderate redness and edema, moderate amount of discharge with presence crusting upon awakening.

Severe conjunctivitis including constant itching, constant tearing, severe discomfort, extreme photophopia even with dark glasses, severe redness and edema, eyelids tightely matted together on awakening.

INCLUSIONS CRITERIA: age of patients 18years to 77years, written informed consent signs.

EXCLUSION CRITERIA: History of Major Ocular surgery four months before, history of chronic eye diseases like glaucoma, allergic conjunctivitis, chronic uveitis ect, active ca, recent trauma, and patients need ocular consultation.

To examine patients with conjunctivitis, gather a thorough medical history. The patient's age and gender are among the demographic data. The current illness's past includes an ocular history, medical history, and societal history. The following aspects are included in the current illness's history: Symptoms and signs "e.g., itching, discharge, irritation, pain, photophobia, blurred vision) Duration of symptoms, Unilateral or bilateral presentation, Character of discharge Recent exposure to an infected individual, Trauma(mechanical, chemical, ultraviolet" , Wearing contact lenses (lens type, hygiene, and use regimen) Symptoms and indications that could indicate the presence of a systemic disease (e.g., genitourinary discharge, dysuria, upper respiratory infection, skin and mucosal lesions) Allergies, as well as the use of topical and systemic drugs, Use of personal care materials. Details concerning prior occurrences of conjunctivitis and previous ophthalmic surgery are included in the ocular history. The following factors are considered in the medical history: Immune dysfunction "e.g., HIV, chemotherapy, and immune-suppressants" is present, status of pregnancy, Systemic diseases in the past "e.g., atopy, Stevens-Johnson syndrome".

The patient's social history contains details such as alcohol consumption, smoking habits, work and hobbies, travel, and sexual activity. Measurement of visual acuity, an external inspection, slit-lamp bio microscopy, and diagnostic testing are the four main components of the initial eye checkup. By inspection in a well-lit room with special notes to: skin, local lymphadenopathy (especially preauricular), anomalies of the eyelids and adnexa (swelling, discolouration, malposition), and conjunctival discharge. By using slit-lamp biomicroscopy with special notes to: Eyelid margin "inflammation, ulceration, discharge, nodules or vesicles, keratinization" lashes on the eyes (nits, lice, crusting, scurf), Canaliculi and lacrimal puncta (pouting, discharge) tarsal and forniceal conjunctiva "papillae, follicles membranes and pseudomembranes; ulceration; hemorrhages; foreign substances; granulation tissue; cicatricial changes, including foreshortening and symblepharon; membranes and pseudomembranes; skin lesions; internal bleeding; foreign particles; granulomas "; ciliary flush, follicles, nodules, chemosis, vesicles, papillae, ulceration, scarring, phlyctenules, vascular injection [hyperemia], ciliary flush, follicles, nodules, chemosis, vesicles, papillae, ulceration, scarring, phlyctenule, hemorrhages, foreign material, keratinization) , Cornea is a type of corneum "epithelial erosions; punctate and dendritic epithelial keratitis; filaments; ulceration; infiltration, including sub epithelial infiltrates and phlyctenules; vascularization; keratic precipitates) Anterior chamber (inflammatory reaction and the iris, including synechiae and trans illumination abnormalities" (inflammatory reaction and the iris, including synechiae and trans illumination defects). COVID19-like symptoms, occupational risks, contact with affected patients and recent travel were all reasons for people to be tested for conjunctivitis. The most prevalent lab tests used to identify COVID19-conjunctivitis are serology and RT-PCR. The reverse-transcription polymerase chain reaction (RT-PCR) is a specific but less sensitive diagnostic tool for COVID

conjunctivitis. Two consecutive negative RT-PCR tests are required before a patient can be pronounced safe.
SARS-CoV-2 antibodies are detected in serum immediately after infection. If a patient's IgM level is high but IgG level is low, the patient is infected. If both IgM and IgG are positive, the infection is recent and may or may not be current. If IgM is negative and IgG is positive, the infection is old. A positive IgG test, on the other hand, does not always mean the patient is no longer susceptible or that its antibodies are functioning properly. [14,15,16]
In individuals with COVID-19 conjunctivitis, lymphopenia, high amino transaminase levels, elevated LDH levels, and elevated inflammatory markers (eg, ferritin, C-reactive protein, and erythrocyte sedimentation rate) have been described.

Statistical Analysis:
The data was analyzed using Version 24 of the Spss Program (SPSS v24). Means and standard deviations have been used to express continuous variables. While discrete variables are expressed as numbers and percentages. A T-test for two independent variables was used to determine the significance of the observed difference in mean age between two separate groups. The Chi-square test for independence was used to establish the significance of the relationship between discrete variables, P value 0.05 was used as the threshold for significance.

The Result of the study:
prevalence of COVID 19 in our study related to conjunctivitis patients was 10.2%(95% confidence interval) [CI]:1.4-1.9). 23 male(65.7%) and 12 female (34.3%) presented with age group between 45years to 76 years. 35 COVID19 conjunctivitis, the unilateral cases were 25 (71.4%) compare to bilateral cases were 10(28.6%) (table 1)
The severity of COVID 19conjunctivitis, moderate 18 cases (51.4%), compare to mild 9cases (25.7%) and severe 5 cases (14.3%), only 7cases (20%) need admission to hospital compare to non-hospitalized 28cases (80%) preauricular lymphadenopathy[LAP] was the most common associated finding with COVID19 conjunctivitis 18 cases (51.4%), followed by hemorrhagic conjunctivitis 5 cases (14.3%), and lid swelling 3 cases (8.6%), while dacryoadenitis /preseptal cellulitis and pseudomembranous conjunctivitis only one case each (2.9%)

The posterior segment finding after dilated fundus exam, only two cases (5.7%) presented with blurred vision due to optic neuritis/acute retinal necrosis (table 2).

Table 1: features of conjunctivitis patients according to COVID-19 status:

Variables	With COVID-19		Without COVID-19		P value
	N=35	100.0%	N=308	100.0%	
Age, M±SD	60.3±15.6		55.7±15.1		0.090
Sex					0.767
• Male	23	65.7	210	68.2	
• Female	12	34.3	98	31.8	
Side of disease					**<0.001**
• Unilateral	25	71.4	102	33.1	
• Bilateral	10	28.6	206	66.9	

The mean age of the two conjunctivitis groups did not differences significantly. (P> 0.05, table 1)
This study found no significant association between sex of conjunctivitis patients and having COVID-19 (P>0.05, table 1).

Table 2: Observations related to conjunctivitis patients with COVID-19:

Variables	N=35	100.0%
Severity		
• Asymptomatic	3	8.6
• Mild	9	25.7
• Moderate	18	51.4
• Severe	5	14.3
Hospitalized		
• Yes	7	20.0
• No	28	80.0
Associated Findings		
• Pseudomembranous	1	2.9
• Lid swelling/ptosis	3	8.6
• Periauricular LAP	18	51.4
• Hemorrhagic	5	14.3
• Dacryoadenitis/preseptal cellulitis	1	2.9
• Optic neuritis/acute retinal necrosis	2	5.7

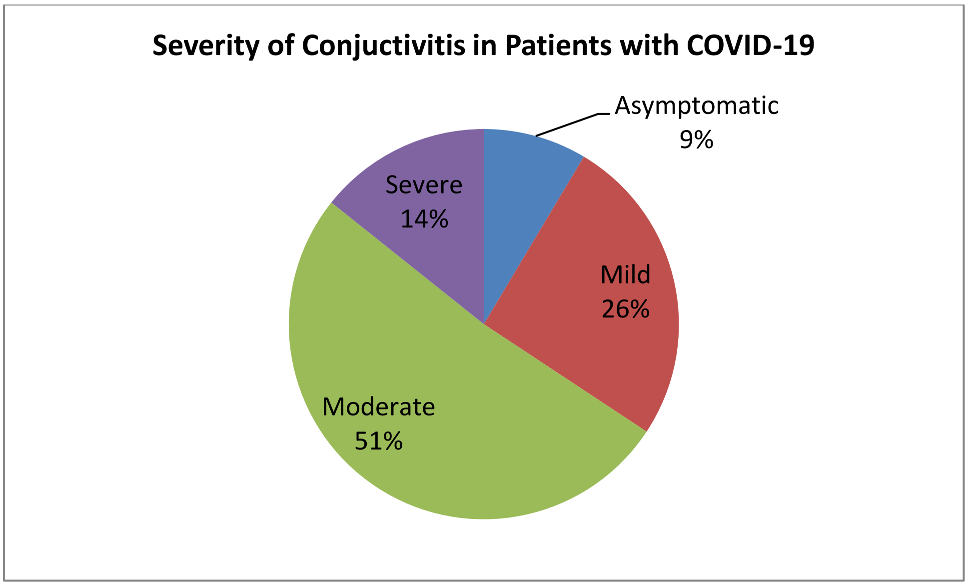

Figure1: Distribution of conjunctivitis patients with COVID-19 infection according to the severity of conjunctivitis.

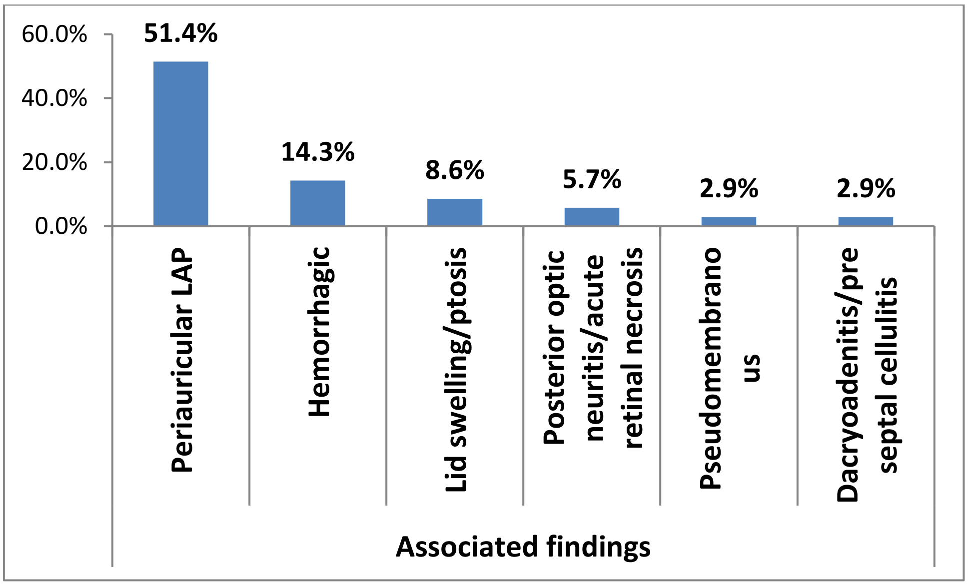

Figure2: Distribution of findings associated with conjunctivitis in patients positive for COVID-19.

DISCUSSION

In this study the prevalence of COVID19 in conjunctivitis patients (10.2%) which is different to the previous reported studies, Researchers identified "conjunctival congestion" in nine of 1,099 COVID19 participants in a study published in the New England Journal of Medicine. It's worth mentioning that "conjunctival congestion" affected only 0.8 percent of the COVID-19 instances that were confirmed. Meanwhile, according to a JAMA Ophthalmology research published March 31, 2020, 12 of 38 COVID-19 patients treated at a hospital in China from February 9 to 15, 2020, displayed symptoms compatible with conjunctivitis. Conjunctivitis was the first symptom for one patient. There is definitely a difference in the percentage of COVID 19 patients with conjunctivitis. Acute conjunctivitis was shown to be prevalent in COVID-19 at rates ranging from 1.1 percent to 15.9 percent. In other research, 31.6 percent of individuals had acute conjunctivitis. According to one meta-analysis study, individuals with non-severe COVID19 had a 4 out of 173 chance of getting conjunctivitis, Those with severe COVID 19 had a 1 in 173 risk of getting it. COVID19 was found to be severe in 5 of 926 people. Only one patient developed the early symptoms of conjunctivitis, according to Wu et al. In our study there was no significant difference in mean age between the two groups of conjunctivitis (P> 0.05, table 1).

This study found no significant association between male and female regarding conjunctivitis patients an with and without COVID-19 (P>0.05, table 1). While most of other studies showed Male patients made up the bulk of patients with viral conjunctivitis. SARS-CoV-2, viral conjunctivitis, COVID-19, meta-analysis) the updated manuscript was approved on February 23, 2021, after it was received on January 31, 2021. COVID-19 conjunctivitis are more likely to have unilateral conjunctivitis (71.4%) than those with conjunctivitis without COVID-19 (P<0.05, table 1) which is more comparable to most reported other studies.[14,16,17]

In our study the conjunctivitis was the initial manifestation of COVID 19 and the severity of conjunctivitis showed moderate 18 cases (51.4%), compare to mild 9cases (25.7%) and severe 5 cases (14.3%), there was no clinical significant between the type of severity of conjunctivitis and need admission to hospital where only 7cases (20%) need admission to hospital compare to non-hospitalized 28cases (80%). Some studies reported conjunctivitis following the onset of COVID-19, Guemes-et al., reported that Prior to admittance to the hospital, 13 patients were discovered to have acute conjunctivitis, twelve patients between admission and evaluation, and ten patients during the examination just one research that included non-hospitalized individuals, all of the included trials were hospitalized by COVID-19. SARS-COV2 infection was confirmed in all of the patients.[17] Palpable preauricular lymphadenopathy was the most common associated finding with COVID19 conjunctivitis 18 cases (51.4%), which is more than whate other reported studies that range from 16% to 25%.[16,17] , followed by haemorrhagic conjunctivitis 5 cases (14.3%), and lid swelling 3 cases (8.6%), while dacryoadenitis /preseptal cellulitis and pseudomembranous conjunctivitis only one case each (2. 9%).The posterior segment finding after dilated fundus exam, only two cases (5.7%) presented with blurred vision due to optic neuritis/acute retinal necrosis (table 2). Limitation of the study is small sample size and lack of duration and there was no pediatric age group.

Conclusion

The study's objective was to determine the COVID19 prevalence rate, in conjunctivitis cases in order to avoid underestimating COVID19 prevalence in a region with stringent regulations and a scarcity of ophthalmological consultations. It's possible that conjunctivitis is the first sign of viral infection. It may have a distinct clinical appearance or be linked to other ocular findings involving the anterior or posterior segments of the eye.

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