

## Original Article

### COVID-19: Effects on Eye in Bangladesh

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#### Abstract

COVID-19 is a contagious disease which can spread person to person mainly by respiratory droplet from infected person and contact by contaminated objects or body limbs through the routes nose, mouth, and eyes. To find out the ocular manifestations that are found in Bangladesh during COVID-19 pandemic this descriptive type of cross-sectional study was conducted to detect the ocular infection and its manifestation among patients admitted at different COVID-19 dedicated hospitals. Total 26 doctor's (Eye Specialists, ICU Consultants, ICU Residents/ Medical Officers, Consultants of other Specialities, Medical Officers/ Residents) observational and examination findings were recorded in this study who have already completed one or more roster [07 days] duties in Corona Dedicated hospitals to treat the COVID-19 affected patients directly. Total 3,678 patients information from different hospitals were collected and interviews were taken directly or over telephone from the participants. Data collected from the participants based on the observations of physicians during COVID roster duties in different corona dedicated hospitals. Age sex and ocular signs and symptoms found in patients during hospitalization were recorded. Total 08 (eight) Corona dedicated hospitals; one Medical University, five tertiary level Govt. hospitals, one private Medical College hospital and one largest Isolation center of South-Asia were included as study place. Among the cases 66.2% were male and 33.8% female. Maximum patients were in age group 40-60 years [40%] and minimum

of them were above 70 years [10%]. Ocular manifestations found in 48 cases and 30 in suspected, total 78 cases found with ocular manifestations. Total 2.121% patients had ocular manifestations in confirmed and suspected cases. In COVID confirmed cases 1.316% patients had ocular manifestations. In conclusion, we found several ocular manifestations in patients who are hospitalized as COVID-19 patients. Moreover, the ocular involvement could be the presenting finding of disease. Further studies are required in Bangladesh and this information may be valuable for future studies.

**Keywords:** Ocular manifestations, SARS-CoV-2, COVID-19, conjunctivitis, conjunctival hyperemia, chemosis, cephora.

#### INTRODUCTION

COVID-19 disease is caused by SARS-CoV-2 and it can cause mild to severe type of respiratory syndromes or illness. This COVID-19 disease was first detected in December 2019 in Wuhan capital of Hubei province of China. Now this is a pandemic disease throughout the world and World Health Organization announced this situation as Global pandemic on 11<sup>th</sup> march 2020. COVID-19 disease is highly infectious and or contagious which can spread through person to person contact mainly respiratory droplets and routes of transmission are nose, mouth and eyes.<sup>1,2</sup> It is proven that corona virus can occur several ocular symptoms in animals such as conjunctivitis, anterior uveitis, retinitis and optic neuritis etc.<sup>3</sup>

Other different types of coronavirus can cause viral conjunctivitis.<sup>4</sup> RT-PCR can detect SARS-CoV-2 in conjunctival secretions when it is collected by sweeping conjunctival fornices<sup>[5]</sup>. Different studies mentioned that the rate of conjunctivitis due to COVID-19 disease in human is less than three percent (<3%).<sup>5-10</sup> In case of COVID-19 disease ocular sign symptoms in less but not unusual at all.<sup>11</sup> Several reports mentioning that conjunctivitis (eye redness, irritation) can be an ophthalmic manifestation in case of COVID-19 patients.<sup>12</sup> As conjunctivitis is common in case of COVID-19 disease, so an Ophthalmologist have to face

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those patients invariably. Li Wenliang, MD, an ophthalmologist who raised his voice first to aware Chinese government about this COVID-19 disease and during treatment he found unusual symptoms in his patients. It is thought that he was exposed in his glaucoma clinic and he was the 1<sup>st</sup> physician who died due to COVID-19 disease.<sup>13</sup>

**Covid-19 update worldwide**

On September 8, 2020 the coronavirus COVID-19 is affecting 213 countries and territories around the world and 2 international conveyances. Total Coronavirus Cases: 27,428,110. Total Deaths: 895,254 and total Recovered: 19,481,282. Among those countries USA position is 1<sup>st</sup>, INDIA 2<sup>nd</sup>, BRAZIL 3<sup>rd</sup> and BANGLADESH position is 15<sup>th</sup>. In the USA total cases and total deaths are respectively 6,473,347 and 193,388. In INDIA total cases and total deaths are respectively 4,276,777 and 72,809. In Bangladesh total cases and total deaths are respectively 327,359 and 4,516.<sup>14</sup>

**Ocular manifestations found in different countries study during covid-19 period**

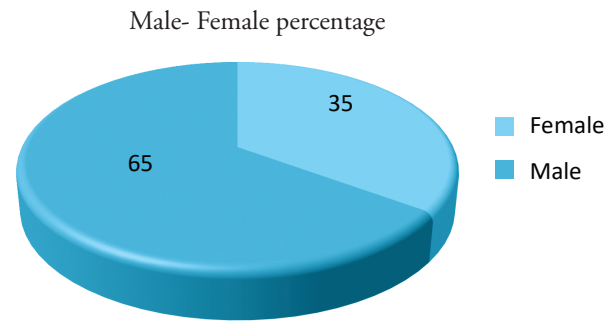
Conjunctivitis (either as the initial presenting illness or during the advanced phase of the COVID-19 illness) 2. Patients with conjunctivitis and confirmed SARS-CoV-2 include: Itching, Redness, Tearing, Discharge, Foreign body sensation, Periorbital pain, Photophobia, Blurred vision.<sup>15</sup> 3. Conjunctivitis.<sup>16,17</sup> That manifested as: Conjunctival hyperaemia/conjunctival congestion, Chemosis, Epiphora or increased secretions 4. Bilateral acute conjunctivitis 5. Eyelid swelling 6. Mild follicular conjunctivitis 7. Unilateral or bilateral bulbar conjunctiva injection 8. Follicular reaction of the palpebral conjunctiva.<sup>13,18</sup>

**INFORMATION COLLECTION**

Information about COVID patients collected directly or over Telephone from the participants. During the information collection the participants were doctors of COVID dedicated hospitals. They are 1. Eye specialists of Bangabandhu Sheikh Mujib Medical University 2. Consultant of other specialities 3. ICU Consultants (Kurmitola General Hospital, Dhaka Medical College Hospital) 4. ICU Medical Officers (Bangabandhu Sheikh Mujib Medical University, Dhaka Medical College Hospital) 5. Medical Officers/ Resident doctors (Bangabandhu Sheikh Mujib Medical University, Kuwait

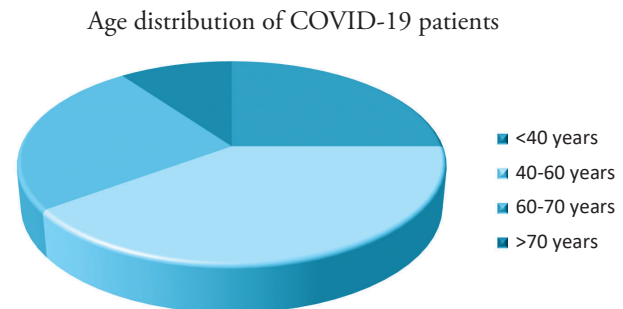
Bangladesh Friendship Government Hospital, Kurmitola General Hospital, Dhaka Medical College Hospital, Mugda Medical College Hospital, Shaheed Suhrawardy Medical College Hospital, Bashundhara COVID Hospital, Holy Family Red Crescent Medical College Hospital).

**RESULTS**



**Figure-1:** Male- Female percentage of hospitalized patients

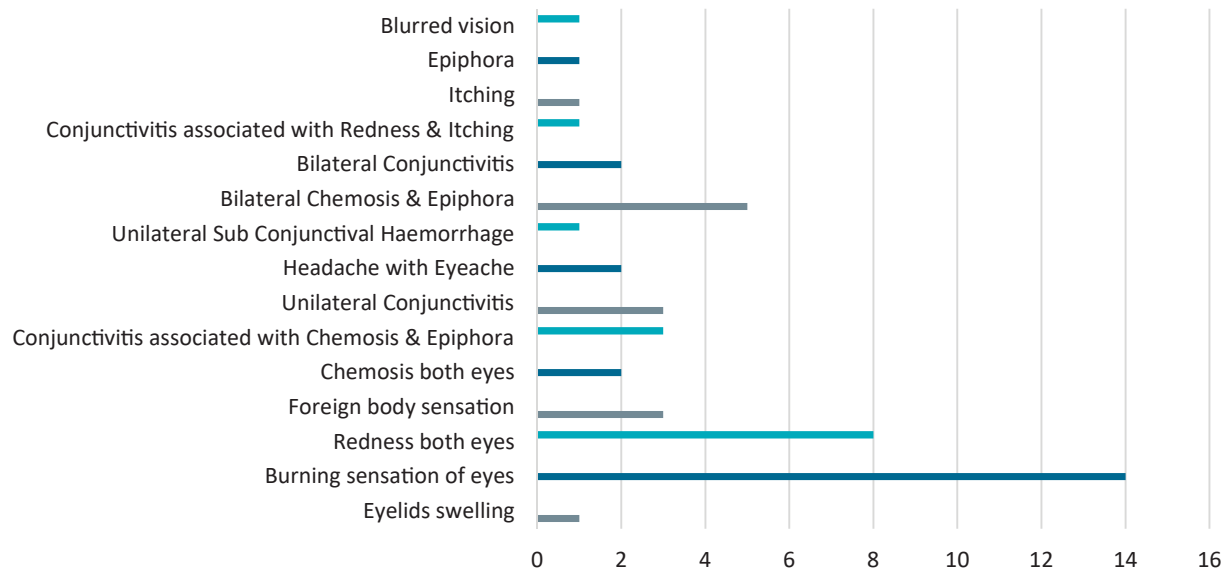
Figure-1 shows that about 65% male and 35% female were hospitalized due to COVID-19 disease. That means male were more affected and also hospitalized more than female patients.



**Figure-2:** Age distribution of hospitalized COVID-19 patients

Figure-2 represents age distribution of hospitalized confirmed COVID-19 patients. Here below 40 (<40) years about 25% patients were hospitalized for COVID treatment. Age ranges 40 to 60 years cover about 40% volume of total hospitalized patients. Age range 60-70 years cover about 25% and ages above 70 (>70) years cover about 10% volume of total hospitalized patients.

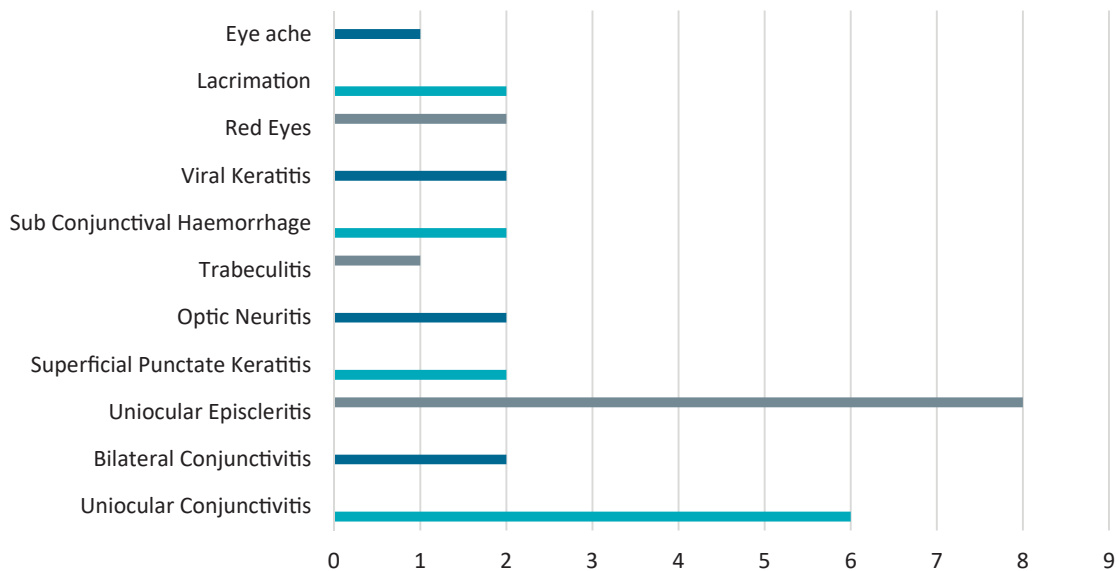
**Ocular manifestations of COVID- 19 patients in Bangladesh**



**Figure-3:** Ocular manifestations of COVID-19 patients

Figure-3 represents Ocular manifestations found in Bangladesh during COVID-19 period in case of confirmed COVID-19 patients. Here total 15 types of ocular manifestations found in different COVID dedicated hospitals in Bangladesh. About 48 cases were detected with ocular manifestations out of 3,648 confirmed COVID-19 hospitalized patients.

**Ocular manifestations in Suspected COVID patients**



**Figure-4:** Ocular manifestations in suspected COVID patients

Figure-4 represents ocular manifestations of suspected COVID-19 patients, suspected means who have similar signs & symptoms of COVID-19 diseases. There are about 11 types of manifestations found in suspected COVID cases but those patients were not hospitalized. They were screened at Bangabandhu Sheikh Mujib Medical University’s outpatients department.

## DISCUSSION

### Scenarios during covid-19 pandemic in Bangladesh

During data collection 26 doctors participated in this study who have completed already one or more than one roster (07 days) duties. Total 08 (eight) Corona dedicated hospitals data accommodated here. Among those hospitals one Medical University, five tertiary level Govt. hospitals, one private Medical College hospital and one largest Isolation center of South-Asia were included. About 3,648 confirmed hospitalized COVID cases and 30 suspected (BSMMU OPD) COVID cases data collected here. In total around 3,678 patients were observed. Among those confirmed cases about 66.2% male and 33.8% female patients. Ocular manifestations found in 48 confirmed cases and in suspected cases there are 30 total 78 cases found here. That means 2.121% patients have ocular manifestations in confirmed & suspected both. But in COVID confirmed cases 1.316% patients have ocular manifestations. With percentage ocular manifestations in confirmed cases are followings:

a) Eyelids swelling: 01 pt. [2.1%] in ICU b) Burning sensation in eyes: 14 pt. [29%] c) Redness both eyes: 08 pt. [16%] d) Foreign body sensation: 03 pt. [6.25%] e) Chemosis both eyes: 02 pt. [4.17%] in ICU f) Conjunctivitis associated with Chemosis & Epiphora: 03 pt. [6.25%] g) Unilateral Conjunctivitis: 03 pt. [6.25%] h) Headache with Eyeache: 02 pt. [4.17%] i) Unilateral Subconjunctival Haemorrhage: 01 pt. [2.1%] j) Bilateral Chemosis & Epiphora: 05 pt. [10.43%] in ICU k) Bilateral Conjunctivitis: 02 pt. [4.17%] l) Conjunctivitis associated with Redness & Itching: 01 pt. [2.1%] m) Itching: 01 pt. [2.1%] n) Epiphora: 01 pt. [2.1%] o) Blurred vision: 01 pt. [2.1%] .

With percentage ocular manifestations in suspected cases are followings:

a) Unilateral Conjunctivitis: 06 pt. [20%] b) Bilateral Conjunctivitis: 02 pt. [6.67%] c) Unilateral Episcleritis: 08 pt. [26.67%] d) Superficial Punctate Keratitis: 02 pt. [6.67%] e) Optic Neuritis: 02 pt. [6.67%] f) Trabeculitis: 01 pt. [3.33%] g) Subconjunctival Haemorrhage: 02 pt. [6.67%] h) Viral Keratitis: 02 pt. [6.67%] i) Red Eyes: 02 pt. [6.67%] j) Lacrimation: 02 pt. [6.67%] k) Eye ache: 01 pt. [3.33%] .

### LIMITATIONS

There is no relevant study for COVID patients on Ocular manifestations in Bangladesh. During data collection all

cases didn't evaluated by Ophthalmologists. COVID-19 is a highly contagious disease transmitted through direct or indirect contact with infected people or contaminated surfaces, that's why observation of all hospitalized COVID-19 patients couldn't be evaluated thoroughly for ocular manifestations.

### OPHTHALMOLOGIST- Back to New Normal life

COVID-19 pandemic when will be finished we don't know. We have to wait for months to years up to appropriate vaccine innovation and maximum hard immunity make up in community level. But our professional activities should not be infirmed. During this period, we must try to ensure our professional safety, our staffs, colleagues' safety and also safety for our families. We have to maintain this new normal life in our daily activities. During professional service we should follow standard triage system for COVID-19. We will ensure non covid service as well as COVID confirmed or suspected cases eye care service with fully standard universal precautions.<sup>19,20</sup>

### CONCLUSIONS

In conclusion, we found several ocular manifestations in patients who were hospitalized as COVID-19 patients. Moreover, the ocular involvement could be the presenting finding of disease. Ophthalmologists may play diagnostic and therapeutic role for comprehensive management of these patients. In Bangladesh more evidence-based studies will be needed in future and this study will play a vital role for future studies.

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**Competing interests** none declared.

### REFERENCES

1. American Academy of Ophthalmology Coronavirus eye safety. 2020 <https://www.aao.org/eye-health/tips-prevention/coronavirus-covid19eye-infection-pinkeye> (access: 2020.04.22)
2. The Lancet Editorial Board. COVID-19: protecting health-care workers. *Lancet*. 2020; 395(10228): 922.
3. Seah I, Agrawal R. Can the Coronavirus Disease 2019 (COVID-19) Affect the Eyes? A Review of Coronaviruses and Ocular Implications in Humans and Animals. *Ocul Immunol Inflamm*. 2020; 1-5.

4. Li JO, Lam DSC, Chen Y, Ting DSW. Novel Coronavirus disease 2019 (COVID-19): The importance of recognising possible early ocular manifestation and using protective eyewear. *Br J Ophthalmol.* 2020 Mar;104(3):297-298.
5. Xia J, Tong J, Liu M, Shen Y, Guo D. Evaluation of coronavirus in tears and conjunctival secretions of patients with SARS-CoV-2 infection. *J Med Virol.* In press; 2020.
6. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, et al. China Medical Treatment Expert Group for Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med.* In press; 2020.
7. Bonn D SARS virus in tears? *Lancet Infect Dis.* 2004; 4(8): 480.
8. Chan WM, Yuen KS, Fan DS, Lam DS, Chan PK, Sung JJ. Tears and conjunctival scrapings for coronavirus in patients with SARS, *Br J Ophthalmol.* 2004; 88(7): 968–969.
9. Loon SC, Teoh SC, Oon LL, Se-Thoe SY, Ling AE, Leo YS, et al. The severe acute respiratory syndrome coronavirus in tears. *Br J Ophthalmol.* 2004; 88(7): 861–863.
10. American Academy of Ophthalmology, Alert: Important coronavirus updates for ophthalmologists, AAO Alerts, (2020) (access: 2020.04.22)
11. Latalska M, Mackiewicz J. The implication of ocular manifestation of COVID-19 for medical staff and patients – a systematic review. *Ann Agric Environ Med.* 2020; 27(2): 165–170. doi: 10.26444/aaem/122790
12. Loon SC, Teoh SC, Oon LL, Se-Thoe SY, Ling AE, Leo YS, Leong HN. The severe acute respiratory syndrome coronavirus in tears. *Br J Ophthalmol.* 2004 Jul; 88(7):861-3.
13. Hu K, Patel J, Patel BC. Ophthalmic Manifestations of Coronavirus (COVID-19) [Updated 2020 Aug 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. StatPearls Publishing Treasure Island (FL)
14. <https://www.worldometers.info/coronavirus/date-08.09.2020>
15. Ocular Manifestations of Hospitalized Patients with COVID-19 in Northeast of Iran/ Ocular immunology and inflammation 2020, VOL. 28, NO. 5, 739-744 <https://doi.org/10.1080/09273948.2020.1773868>
16. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, Liu L, Shan H, Lei CL, Hui DSC, Du B, Li LJ, Zeng G, Yuen KY, Chen RC, Tang CL, Wang T, Chen PY, Xiang J, Li SY, Wang JL, Liang ZJ, Peng YX, Wei L, Liu Y, Hu YH, Peng P, Wang JM, Liu JY, Chen Z, Li G, Zheng ZJ, Qiu SQ, Luo J, Ye CJ, Zhu SY, Zhong NS., China Medical Treatment Expert Group for Covid-19. Clinical Characteristics of Coronavirus Disease 2019 in China. *N. Engl. J. Med.* 2020 Apr 30; 382(18):1708-1720.
17. Wu P, Duan F, Luo C, Liu Q, Qu X, Liang L, Wu K. Characteristics of Ocular Findings of Patients With Coronavirus Disease 2019 (COVID-19) in Hubei Province, China. *JAMA Ophthalmol.* 2020 Mar 31;
18. Chen L, et al. *Br J Ophthalmol* 2020; 104: 748–751. doi:10.1136/bjophthalmol-2020-316304/ Ocular manifestations of a hospitalised patient with confirmed 2019 novel coronavirus disease.
19. Nepal Ophthalmic Society COVID 19 Ophthalmology Practice Guidelines | April 2020
20. All India Ophthalmological Society – Indian Journal of Ophthalmology consensus statement on preferred practices during the COVID-19 pandemic: Year: 2020 | Volume : 68 | Issue : 5 | Page : 711-724