

Uncommon presentation of COVID-19 in ophthalmology: a case report



Cisca Kuswidyati^{1*}, Andre², Klarissa Chrisalim³

ABSTRACT

Introduction: The COVID-19 pandemic is well known for its clinical respiratory symptoms. Currently, the medical literature describing the neuro-ophthalmologic manifestations of COVID-19 is gradually emerging. We hereby report a case with an uncommon presentation of COVID-19 in a patient.

Case Report: A 19-year-old man presented with ptosis and limited left eye movement in his left eye followed by other neurological manifestations, without classical respiratory manifestations. Brain imaging and nasopharyngeal PCR suggest COVID-19 encephalitis.

Conclusion: This experience confirms that COVID-19 infections can be present despite the absence of significant respiratory symptoms mimicry to other symptoms. Therefore, physicians should consider the possibility of COVID-19 infections, and time management may lead to a better outcome.

Keywords: COVID-19, encephalitis, neuro-ophthalmologic.

Cite This Article: Kuswidyati, C., Andre., Chrisalim, K. 2022. Uncommon presentation of COVID-19 in ophthalmology: a case report. *Bali Medical Journal* 11(1): 189-191. DOI: 10.15562/bmj.v11i1.3006

INTRODUCTION

COVID-19 pandemic is initially well known for its clinical respiratory symptoms such as cough, shortness of breath, fever, and loss of taste. By the end of 2020, over 217.5 million cases have been reported globally, with approximately 4.5 million deaths according to the World Health Organization.¹ With more patients becoming infected, it was noted that the disease could affect various organ systems. Although COVID-19 primarily impacts the respiratory system, medical literature describing the ophthalmological and neurological complications in association with COVID-19 are gradually emerging.² Early studies in China showed that ocular manifestations of COVID-19 were rare (0.8%).³ A 2021 meta-analysis reported a higher COVID-19 ocular manifestation prevalence (11.03%). Conjunctivitis (88.8%), dry eye (16%), redness (13.3%), tearing (12.8%), itching (12.6%), and eye pain (9.6%) were the most frequent symptoms reported.⁴ A small number of case reports describe the new onset of neuro-ophthalmology manifestation in patients with COVID-19, including cranial nerve palsies, optic neuritis, and sequelae from cerebrovascular events.⁵⁻⁷ Faucher et al. reported a young 21-year-old man with acute onset diplopia and 16 days after developing respiratory COVID-19 symptoms, without any other comorbidities.⁶ Belghmaidi et al. reported a similar case. A 23-year-old woman

confirmed COVID-19 presented with acute onset diplopia, three days after general symptoms without previous medical history.⁸

There have been small, but growing reports of neuro-ophthalmologic manifestations in patients with COVID-19.⁹ This case report highlights a possible neuro-ophthalmologic manifestation in a patient with COVID-19. It emphasizes the need for awareness of neuro-ophthalmologic manifestation as one of the COVID-19 symptoms.

CASE PRESENTATION

A 19-year-old Indonesian man, without any medical history such as diabetes, hypertension, obesity, dyslipidemia, family neurological disease, was consulted by the neurology department with acute total painless ptosis in the left eye and double vision with no other previous symptoms. He was systemically well without headache, other focal neurological signs, fever and respiratory symptoms. The patient had binocular diplopia. Clinical examinations were notable for left eye ptosis, and left eye movements were limited to all directions. Left eye pupil was dilated, diameter 5 mm, and no reaction for direct light. Other anterior and posterior segments were unremarkable. There was no palpable mass or swelling in the periorbital. After three days, the patient presented to the Emergency Department with other neurological

¹Department of Ophthalmology, Atma Jaya Hospital, School of Medicine and Health Sciences, Atma Jaya Catholic, Universitas Indonesia, Jakarta;

²Department of Neurology, Atma Jaya Hospital, School of Medicine and Health Sciences, Atma Jaya Catholic Universitas Indonesia, Jakarta;

³School of Medicine and Health Sciences, Atma Jaya Catholic, Universitas Indonesia, Jakarta;

*Corresponding author:

Cisca Kuswidyati;
Department of Ophthalmology, Atma Jaya Hospital, School of Medicine and Health Sciences, Atma Jaya Catholic Universitas Indonesia;
cisca.kuswidyati@atmajaya.ac.id

Received: 2021-12-06

Accepted: 2022-03-20

Published: 2022-04-08

manifestations such as seizures and altered consciousness. Before being admitted to the room, the patient was checked RT-PCR SARS-CoV2 and showed a positive result. This case was a collaboration case with neurology, ophthalmology, and the internal department.

After admission, laboratory and radiological investigations were performed. Brain magnetic resonance imaging (MRI) showed the hypodense area in the frontal lobe and left temporal suggesting encephalitis. CT thorax showed minimal consolidation in the 10th segment of the right lobe lung. Laboratory findings such as D-dimer, PT, APTT were unremarkable. The symptoms significantly improved after being treated supportively for COVID-19 (Remdesivir 100mg/day for 10 days, Levetiracetam 1250 mg q12h, Heparin 7500u q8h, Mecobalamin 500µg q12h). Most of his symptoms were resolved within 14 days, and the patient was discharged with neurologic and ophthalmologic follow-up with Citicoline 1000mg/day for neuroprotective effects. No adverse effects of the treatment were noted. One month after discharge, his symptoms continued to improve and resolved completely.

DISCUSSION

Since the beginning of the COVID-19 pandemic, SARS-CoV2 has been known for respiratory manifestations such as coughing, shortness of breath, and fever. With more patients becoming infected, the range of affected organs has widened, affecting multiple systems, which can sometimes be misleading. There have been small, but growing reports of neuro-ophthalmologic manifestations in patients with COVID-19.⁹ However, the mechanism of neuro-ophthalmologic manifestations in COVID-19 is not known well yet.¹⁰ Although neuro-ophthalmologic manifestations can be caused by other disorders, including vascular disorders, tumors, or diabetes.^{6,7} In this case, the neuro-ophthalmologic manifestations found in clinical examinations have no underlying structural cause, suspecting COVID-19 infection as the cause. Faucher et al. documented a similar case, a 21-year-old man with acute onset partial left oculomotor nerve palsy that

cause binocular diplopia without ptosis or mydriasis, 16 days after developing respiratory COVID-19 symptoms, his clinical course involved six days of intubation and intensive care unit also Rovamycine, Hydroxychloroquine, Low molecular weight Heparin as the main therapy. His MRI showed a few arterial micro-ectasia but the patient spontaneously recovered from his diplopia within 7 days.

This case suggested that SARS-CoV-2 is a neurotrophic virus that can induce encephalitis, affecting the sixth or third cranial nerve that can cause ocular motor paresis.⁶ Belghmaidi et al. reported a similar case, a 23-year-old woman confirmed COVID-19, with an acute painless palsy of the third cranial nerve, three days after general symptoms without previous medical history. Her oculo-cerebral MRA was unremarkable, and after getting treatment with Chloroquine and Azithromycin, she completely recovered by the sixth day of treatment.⁸ Several studies have suspected that SARS-CoV2 may spread directly through systemic circulation to the cerebral or penetrate through the cribriform lamina of the ethmoid bone through inflammatory response, immune mechanism, and microvascular disease.^{7,11} Angiotensin-converting enzymes II (ACE II) receptors found in the endothelial cell of the oral, nasal mucosa, and the nervous system may act as the entry point of the virus and cause neurological involvement in the patient.¹² Neurological symptoms can be a direct effect of virus neurotropism or a systemic consequence of immune-mediated mechanism after infection.¹³ Finsterer et al. suspected that a cranial nerve involvement results from the uptake of the virus into the intracellular space of neurons at a distal location and then retrograde transport to the brain or the effect of immunological reactions against the virus that secondarily disrupt the neuronal structure as in GBS.¹⁴ Another case reported that microthrombi formation secondary to COVID-19 infection, shown by elevated D-dimer, prolonged prothrombin time should be considered a possible etiology.¹⁵

The increased risk of arterial and venous thrombosis is thought to be

caused by inflammation, often occurs in ischemia and is possible to develop cranial neuropathies and cause neuro-ophthalmologic manifestations.⁵ Yet, the exact pathology remains unknown. More research needs to be done to understand better the pathogenesis between COVID-19 and neuro-ophthalmologic manifestations.

CONCLUSION

SARS-Cov-2 virus prior manifestation is not only pulmonary disease but can also cause a wide range of symptoms such as neuro-ophthalmologic manifestations. Even though the exact pathology is still unclear, this case emphasizes the need for awareness of neuro-ophthalmologic manifestation as one of the COVID-19 symptoms.

CONFLICT OF INTEREST

The author states that there is no conflict of interest regarding the publication of this case report.

FUNDING

The authors are responsible for the funding without the involvement of grants, sponsorship, or any other funding sources.

AUTHOR CONTRIBUTION

All authors are contributed equally to the content of the study.

ETHICS IN PUBLICATION

The patient has signed informed consent regarding the publication of medical data in medical scientific journals.

REFERENCES

1. WHO Coronavirus (COVID-19) Dashboard [Internet]. [cited 2021 Sep 13]. Available from: <https://covid19.who.int>
2. Iltaf S, Fatima M, Salman S, Salam J-U, Abbas S. Frequency of Neurological Presentations of Coronavirus Disease in Patients Presenting to a Tertiary Care Hospital During the 2019 Coronavirus Disease Pandemic. *Cureus*. 2020 Aug 18;12(8):e9846.
3. Hu K, Patel J, Swiston C, Patel BC. Ophthalmic Manifestations Of Coronavirus (COVID-19). In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 [cited 2021 Sep 3]. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK556093/>

4. Nasiri N, Sharifi H, Bazrafshan A, Noori A, Karamouzian M, Sharifi A. Ocular Manifestations of COVID-19: A Systematic Review and Meta-analysis. *J Ophthalmic Vis Res.* 2021 Jan 20;16(1):103–12.
5. Betsch D, Freund PR. Neuro-Ophthalmologic Manifestations of Novel Coronavirus. *Adv Ophthalmol Optom.* 2021 Aug;6:275–88.
6. Faucher A, Rey P-A, Aguadisch E, Degos B. Isolated post SARS-CoV-2 diplopia. *J Neurol.* 2020 Jun 12;1–2.
7. Douedi S, Naser H, Mazahir U, Hamad AI, Sedarous M. Third Cranial Nerve Palsy Due to COVID-19 Infection. *Cureus.* 13(4):e14280.
8. Belghmaidi S, Nassih H, Boutgayout S, Fakiri KE, Qadiri RE, Hajji I, et al. Third Cranial Nerve Palsy Presenting with Unilateral Diplopia and Strabismus in a 24-Year-Old Woman with COVID-19. *Am J Case Rep.* 2020 Oct 15;21:e925897-1-e925897-5.
9. Tisdale AK, Chwalisz BK. Neuro-ophthalmic manifestations of coronavirus disease 19. *Current Opinion in Ophthalmology.* 2020 Nov;31(6):489–94.
10. Ptosis: Evaluation and management Pauly M, Sruthi R - Kerala J Ophthalmol [Internet]. [cited 2021 May 21]. Available from: <https://www.kjophthal.com/article.asp?issn=0976-6677;year=2019;volume=31;issue=1;page=11;epage=16;aulast=Pauly>
11. Goel K, Kumar A, Diwan S, Kohli S, Sachdeva HC, Ganapathy U, et al. Neurological Manifestations of COVID-19: A Series of Seven Cases. *Indian J Crit Care Med.* 2021 Feb;25(2):219–23.
12. Katti V, Ramamurthy LB, Kanakpur S, Shet SD, Dhoot M. Neuro-ophthalmic presentation of COVID-19 disease: A case report. *Indian Journal of Ophthalmology.* 2021 Apr;69(4):992–4.
13. Doblán A, Kaplama ME, Ak S, Basmacı N, Tarini EZ, Göktaş ŞE, et al. Cranial nerve involvement in COVID-19. *Am J Otolaryngol.* 2021;42(5):102999.
14. Finsterer J, Scorza FA, Scorza CA, Fiorini AC. COVID-19 associated cranial nerve neuropathy: A systematic review. *Bosn J Basic Med Sci.* 2022 Feb;22(1):39–45.
15. Fitzpatrick JC, Comstock JM, Longmuir RA, Donahue SP, Fitzpatrick JM, Bond JB. Cranial Nerve III Palsy in the Setting of COVID-19 Infection. *J Neuroophthalmol.* 2021 Sep 1;41(3):e286–7.



This work is licensed under a Creative Commons Attribution