Optic Neuritis And Pseudotumor Cerebri Co-Existence İn A Patient With A Recent COVID-19 Infection

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Abstract

Objectives: COVID-19-associated neurological manifestations are widely reported. In this case report, we describe a patient who presented with painful eye movements before being diagnosed with Covid-19. Methods: A previously healthy 11-year-old girl presented to our hospital with a history of bilateral painful eye movements. The patient had a history of cough, headache and fever 2 weeks ago, and it was learned that his mother had a positive COVID 19 test at that time. The neurological examination revealed the presence of bilateral papilloedema and the rest of the pediatric and neurological examination was normal. Brain MRI and MR venography normal, orbital MRI showed suspected enhancement of the left optic nerve intracranial segment and significant bilateral long latency visual evoked potentials responses were obtained on the right. Rapid antigen tests for COVID-19 was negative but IgM antibody test positive. Cerebrospinal fluid pressure was 39 cm H2O detected by lumbar puncture after patient sedation. CSF cell count, glucose, protein values, and the study of viruses and bacteria in CSF were normal. Results: Orbital MRI and VEP findings raised the suspicion of postinfectious optic neuritis and with evidence of increased intracranial pressure by LP findings, intravenous methylprednisolone and acetazolamide were initiated. Conclusion: The association between optic neurit or pseudotumor cerebri and covid infections has been described. To our knowledge, this is the first pediatric case report to establish concurrent intracranial hypertension, optic neuritis and COVID-19 infection. This relationship seems to be due to immune-mediated process which cause symptoms that appear after active infection.

Objectives

SARS-CoV-2 causes substantial pulmonary disease and is associated with detrimental effects on several other processes, such as cardiovascular, gastrointestinal, hematologic, renal, endocrinologic, dermatologic, neurologic, and ophthalmologic. In this case report, we describe a patient who presented with painful eye movements before being diagnosed with Covid-19.

Methods

A previously healthy 11-year-old girl presented to Baskent University Faculty of Medicine, Dr Turgut Noyan Teaching and Medical Research Center, Pediatric Neurology Outpatient clinic with a history of bilateral painful eye movements. The patient had a history of cough, headache and fever two weeks ago, and it was learned that his mother had a positive COVID-19 test at that time.

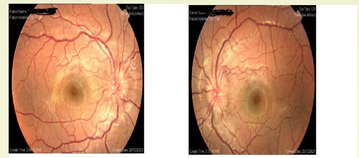
The vital signs and physical examination were normal. The neurological examination revealed the presence of bilateral papilloedema and the rest of the pediatric and neurological examination was normal.

Laboratory analyses revealed normal blood count, serum C-reactive protein, and erythrocyte sedimentation rate. The liver, kidney, and thyroid function tests, vitamin A, B12, folic acid, and serum electrolyte levels and serum creatine kinase were normal

Brain MRI and MR venography normal, orbital MRI showed suspected enhancement of the left optic nerve intracranial segment and significant bilateral long latency visual evoked potentials responses were obtained on the right. Rapid antigen tests for COVID-19 was negative but IgM antibody test positive. Cerebrospinal fluid pressure was 39 cm H2O detected by lumbar puncture after patient sedation. CSF cell count, glucose, protein values normal, the study of viruses and bacteria and Lyme serology were all negative. CSF oligoclonal bands were not present, and and the immunoglobulin (Ig) G index was normal, serum autoantibodies against aquaporin 4 (anti-NMO), anti-myelin oligodendrocyte glycoprotein antibodies (MOG-IgG) were negative. No other causes of intracranial hypertension were found. The patient was treated with acetazolamide 500 mg bid

Results

Orbital MRI and VEP findings raised the suspicion of postinfectious optic neuritis and with evidence of increased intracranial pressure by LP findings, intravenous methylprednisolone and acetazolamide were initiated.



Figüre 1. Papilledema

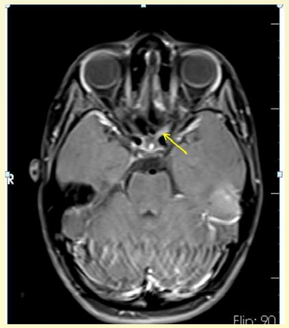
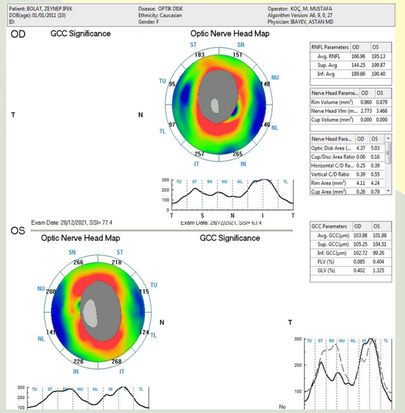


Figure 2. MRI showed suspected enhancement of the left optic nerve intracranial segment



Figüre 3. In the retinal nerve fiber thickness analysis of the patient shown by optic coherence tomography (OCT), the increase in thickness of both optic discs is remarkable.

Conclusion

Multiple neuro-ophthalmologic manifestations such as optic neuritis, diplopia and ptosis suggestive of Miller-Fisher variant of Guillain Barre syndrome, increased intracranial pressure, chemosis, Eye movement abnormalities and nystagmus, visual field defects have been described in association with COVID-19.

The mechanisms of involvement are still unknown, but they tend to fall into three general categories – the post-viral inflammatory syndrome, the sequelae of a proinflammatory state with hypercoagulability, and the “cytokine storm,” and the result of systemic abnormalities including hypoxia and severe hypertension. Direct viral invasion seems to be a rare manifestation of COVID-19.

Optic neuritis and pseudotumor cerebri co-existence in a patient with a recent COVID-19 Infection has been described. To our knowledge, this is the first pediatric case report to establish concurrent intracranial hypertension, optic neuritis and COVID-19 infection. This relationship seems to be due to immune-mediated process which cause symptoms that appear after active infection.

References

1. Sardar, S., Safan, A., Okar, L., Sadik, N., & Adeli, G. (2021). The diagnostic dilemma of bilateral optic neuritis and idiopathic intracranial hypertension coexistence in a patient with recent COVID-19 infection. *Clinical Case Reports*, *9*(6), e04347.