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De Novo Presentation of Idiopathic Intracranial Hypertension (IIH) Associated With COVID-19 Infection

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Abstract

The COVID-19 virus has been associated with a variety of neurological complications. We present the case of a 41 year old woman who presented with visual symptoms associated with COVID-19 infection. Neurological examination revealed bilateral papilledema and after exclusion of other disorders such as brain tumour and sinus thrombosis she received a diagnosis of IIH, fulfilling the diagnostic criteria for this disorder. We believe there is a causal association between COVID-19 and IIH in her case. Doctors treating COVID-19 patients should be aware of this possible association as early diagnosis and treatment can be important to prevent visual deterioration.

Keywords

Covid-19 infection, blurred vision, idiopathic intracranial hypertension

Introduction

Recently the COVID-19 virus emerged as a novel infectious disorder and a pandemic was declared in March 2020. This virus has been associated with a variety of neurological complications including headache, seizures, cerebrovascular disease, viral encephalitis, acute disseminated encephalomyelitis, Guillain-Barre syndrome and anosmia.[1] Here we describe one more possible complication of COVID-19, we present the case of a woman who was diagnosed with IIH associated with COVID-19 infection.

Case Report

We present the case of a 41-year-old woman with no previous history of headache or visual problems. In November 2020 she was diagnosed with Covid-19 infection, confirmed by a polymerase chain reaction test. She presented with fever which lasted for several days but she had no respiratory symptoms. During the infection she had constant bilateral frontal headache which was severe. Within 2 weeks the headache gradually disappeared. In December she noticed gradually impaired vision. She described it as tiredness and a "sand feeling" in her eyes and even an incomplete left visual field defect. An ophthalmologist´s examination confirmed bilateral papilledema and extremely enlarged blind spots, especially on the left side. There was also a slight impact of the left visual field and a normal visual acuity. The patient was referred to neurologist. A computed tomography (CT) scan of the brain and a CT venography was performed. There were no focal changes in the brain and no signs of cerebral venous thrombosis. On the same imaging study there was a widening of the vein of Galen, which was interpreted as a clinically insignificant and incidental finding.

This patient has no previous significant medical history, she is a non-smoker, does not use alcohol or any medications, aside from an intrauterine hormonal coil. The patient is slightly overweight with a body mass index (BMI) of 29.

On neurological examination she had no focal neurological findings. Lumbar puncture was performed in the lateral decubitus position with legs extended and the cerebrospinal opening pressure was increased, 50 cm H2O. The cerebrospinal fluid had a normal composition and the clinical diagnosis of idiopatic intracranial hypertension (IIH) was made. She received treatment with acetazolamide. At 3 months follow-up the patient had no headache, her vision was improved and the papilledema was reduced.

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Discussion

We describe a woman with no previous history of neurological symptoms who developed visual disturbances few a weeks after a COVID-19 infection. Neurological examination showed bilateral papilledema but there were no other abnormal neurological findings. Routine investigations including a CT scan of the brain, brain venography and lumbar puncture showed no signs of conditions such as brain tumor, sinus thrombosis or CNS infections. The diagnostic criteria for IIH by Friedman et al were fulfilled[2] and after receiving this diagnosis she was treated with acetazolamide.

We have found 2 previous publications addressing the association between COVID-19 and intracranial hypertension.[3,4] The first one is case report describing the suspected association between IIH and COVID-19. This was a 35-year old woman presenting with headache and increased intracranial pressure during COVID-19 infection. In this case presentation the exact findings from ophthalmoscopy were not presented and a brain venography excluding sinus thrombosis was not mentioned.[3] The other publication is by Silva et al where they present the results from lumbar puncture done for various reasons in 56 patients with COVID-19. All patients had normal CSF analysis, but six of them had opening pressure > 25 mmH20 and papilledema was documented in 2. The authors propose that a low-grade inflammation in conjunction with hyperviscosity and hypercoagulable state could result in intracranial hypertension in some affected individuals with COVID-19.[4]

A recently published study by Sundholm et al provides convincing support for an association between IIH and recent infections and/or inflammatory states. The study showed a 3-fold increase in IIH associated with recent infections and inflammatory disorders and the risk was particularly increased for those who were diagnosed with an infection or an inflammatory disorder in the last 3 months before IIH diagnosis. In their discussion Sundholm et al refer to several case reports, mostly in children, describing a clinical syndrome like IIH but with its onset associated with syphilis, hepatitis A, varicella, measles and other viral infections.[5] One of these cases was an 8-year-old girl who presented with headache, nausea, vomiting, photophobia and papilledema 3 weeks after a clinically and serologically confirmed measles infection. Magnetic resonance imaging of the brain including venography showed no pathology. Lumbar puncture demonstrated an opening pressure of 30 cm H20, no cells and normal levels of glucose and protein. An IIH diagnosis was made and the patient received treatment with acetazolamide, mannitol and prednisolone and she improved both clinically and in terms of the opening pressure.[6]

One limitation in our case is that we cannot exclude that the patient had raised intracranial pressure before being infected with COVID-19. She has a body mass index of 29, which means she is slightly overweight which is a known risk factor for IIH. However, she had not experienced any visual disturbances before the infection and we believe it is most likely that the COVID-19 infection led to increased intracranial pressure and was the cause or at least a contributing factor, which led to the clinical presentation of IIH. This conclusion is consistent with the previously mentioned evidence that IIH has convincingly been shown to be associated with recent infections and inflammation.[5]

Conclusion

In summary we present a case of de novo presentation of IIH in a young woman with COVID-19 infection. Given that our patient had no previous history of any neurologic symptoms and the demonstrated association between infectious diseases and IIH in prior studies, we believe there was a causal association between COVID-19 and IIH in her case. Doctors treating COVID-19 patients should be aware of this possible association as in some cases early diagnosis and treatment can be important to decrease the risk of permanent visual deficits that can occur in patients with IIH.

Declaration of Conflicting Interests

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