Unilateral internal carotid artery and middle cerebral artery thrombosis in a pediatric patient with mildly symptomatic COVID-19: Case report and literature review

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ABSTRACT

The incidence of ischemic stroke in COVID-19 positive adult cases is between 1-3%. The stroke rate associated with COVID-19 in children is not as common as in adults. The mildness of COVID-19 infection may cause this cause to be overlooked in children presenting with stroke. Here, we present a 13-year-old male case with confusion and right hemiparesis, who was found to have total occlusion in the left ICA and MCA. In the patient whose risk factor for arterial thrombosis could not be determined, covid19 antibody was positive (13.76 U/ml) due to the history of mild URTI 2 weeks before the stroke. Our case draws attention to the fact that ICA and MCA thrombosis can develop even in mild covid 19 infection in children, so COVID-19 should not be ignored in the etiology of stroke.

INTRODUCTION:

The clinical spectrum of coronavirus disease 2019 (COVID-19) ranges from the asymptomatic form to severe illness. Although it is mainly a respiratory disease, studies suggest that it may lead to hypercoagulopathy and thrombotic complications [1]. Symptomatic/asymptomatic cases with COVID-19 have been associated with thrombosis. While the annual incidence of pediatric arterial ischemic stroke (AIS) ranges from 1.3 to 1.72 per 100,000 children, few data are available on the occurrence of AIS in pediatric COVID-19 [2]. Neurological involvement was detected in 22% of the case series of 1695 patients which was published in March-December 2020, and 53% of these cases were previously healthy cases. In another study, stroke was detected in 12 of the cases, and it was reported that only 4 of them were directly associated with COVID-19 infection without a stroke risk factor [3].

CASE PRESENTATİON

A 13-year-old male patient, who had no health problems in the past, except for a mild viral upper respiratory tract infection (URTI) two weeks before his admission, presented with confusion, weakness in the right arm and leg, and paralysis on the right side of the face. After the patient's brain computed tomography (CT) was normal, acute infarction was observed in the left MCA irrigation areas in the brain magnetic resonance imaging (MR), total occlusion was observed in the left ICA and MCA in the MR angiography (Fig.1). In brain MRI, upon detection of an acute infarct area showing diffusion restriction in the left basal ganglia, left frontotemporal lobe and left insular cortex, the patient was given enoxaparin sodium, acetylsalicylic acid, 3% NaCl for antiedema, mannitol, dexamethasone and neuroprotective piracetam. He was started on 20 mg/kg levetiracetam due to her seizure lasting approximately 2 minutes 4 hours before her admission. On motor examination, right arm muscle strength was 1/5, and right lower extremity 2/5. He had left peripheral facial paralysis, bilateral DTR vitality and Babinski positivity. All his pulses could be taken. Atelectasis was observed in the chest X-ray of the patient who developed respiratory distress on the third day. For one week, 4 doses of dexamethasone from 0.6mg/kg and 3 doses of mannitol from 0.75gram/kg were given again.D-dimer level on arrival was elevated 0.77 mg/L (normal 0-0.55 mg/L). COVID-19 antibody (Ab) tested for a previous URTI during the pandemic was positive: 13.76 U/ml (total Ab developed against spike protein, quantitative total Ab).The patient's muscle strength was 1/5 (proximal and distal) in the right arm and 4/5 in the right lower extremity. At his control two months later, he was walking without support, and his muscle strength on the right was 3/5 in the upper extremity and 4/5 in the lower extremity. His facial palsy had regressed significantly, and his speech was fluent. In the control brain MR angiography; Vascular structures were normal except mild stenosis in the left middle cerebral artery M1 segment.

DISCUSSION

The incidence of ischemic stroke in COVID-19 positive adult cases is 1-3% . In the literature, there are rare cases reported in children since the pandemic. To the best of our knowledge, our patient is the smallest case with large vessel occlusion due to COVID-19 and without an underlying comorbid disease. In recent years, the rate of stroke in young people has increased relatively and 44% is due to hematological and vasculopathic causes. Other causes include infections, drugs, connective tissue disease, thrombophilia, vasculitis, and malignancy [4].

Despite the increased incidence of COVID-19 in children, there are few cases of acute ischemic stroke due to large vessel occlusion associated with COVID-19 described in the literature .Endothelial damage that develops concurrently with hypercoagulopathy in COVID-19 disease facilitates thrombus formation . COVID-19 may present with serious vascular complications several weeks after the mildly symptomatic acute phase. Initial reports in China identified cerebrovascular disease and stroke in 5% of patients with severe COVID-19 disease, on average 2 weeks after diagnosis . However, cases with stroke after mild symptomatic COVID-19 are rare in the literature[5]. Our case presented with a picture of thrombosis and stroke defined in severe cases, although he had mild URTI symptoms 2 weeks before his admission to COVID-19.

As far as we can see in the literature, MCA involvement alone was observed in most of the cases with COVID-19, while 1 case with ICA and MCA together was detected. In our case, ICA and MCA were also involved.

CONCLUSION

In conclusion, our case reveals that stroke associated with large vessel occlusion due to COVID-19 may develop in children as well. It is very important to question the history of viral infection in the patient and his family while investigating the factors related to the etiology of stroke, since it may be overlooked due to its rarity in childhood. It is recommended to investigate he diagnosis of COVID-19 in children presenting with stroke in the pandemic.

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