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Case Report

Case Report of Acute Thoraco-Lumbar Subdural Hematoma in A Patient with COVID-19

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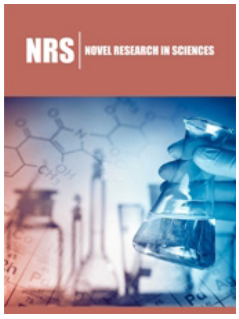

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Abbreviations: SARS: Severe Acute Respiratory Syndrome; MR: Magnetic Resonance; CNS: Central Nervous System

Introduction

The neurologic manifestations of the Coronavirus are under investigation. It is estimated to have a prevalence of 36.4% of neurologic complications in patients with COVID-19 while in severe infections this prevalence is nearly 45.5% [1,2]. We report a central nervous system hemorrhagic complication in a patient with Severe Acute Respiratory Syndrome (SARS) secondary to COVID-19 infection.

Clinical Details and Management

A 66-year-old female patient was admitted with four days of mild respiratory symptoms in October of 2020. At admission, chest CT scan revealed multiple pulmonary opacities with bilateral, peripheral ground glass opacification in more than 50% of pulmonary parenchyma and bilateral pleural effusion. Coronavirus infection was confirmed by rt-PCR for SARS-CoV-2. Patient presented clinical complications during ICU stay due to respiratory insufficiency and systemic hyperinflammation with one episode of cardiorespiratory arrest. The patient presented a satisfactory clinical outcome after intensive care and was extubated after 1 week ICU stay. In neurologic examination, patient presented with a medullary syndrome with paraplegia, sensory level at T8, absence of deep reflexes in inferior limbs and hypotonic anal sphincter. The patient underwent an urgent spinal cord Magnetic Resonance (MR) that revealed extensive left subdural hematoma in the spinal canal from T11 to L2 with significant spinal cord lateral displacement. Urgent spinal cord decompression was performed through T10 to L2 laminectomy and resection of spinal subdural hematoma. On investigation work-up, medullary angiography was performed but no vascular lesions were found. After three months follow-up patient showed no motor improvement in inferior limbs and sensory level has not changed.

Discussion

The coronavirus infection brought to the world a catastrophic systemic disease with intense inflammatory reaction and multiorgan involvement. The mechanisms of neurologic manifestation of the COVID-19 have not been clarified since those neurologic conditions occur within a conjunction of hypoxemia, hypercoagulability, severe endothelial damage, high levels

of toxic metabolites and secondary cytokines. The blood brain barrier dysfunction hypothesis is the most reasonable explanation for direct inflammatory damage in the Central Nervous System (CNS) [2]. Cerebrovascular diseases in patients with coronavirus disease are mostly ischemic events especially in the vertebrobasilar territory. Poyiadji et al. [3] described the first hemorrhagic complication in the CNS in a patient with COVID-19 as an Acute hemorrhagic necrotizing encephalopathy, a rare complication of other viral infections such as influenza. The imaging investigation revealed hemorrhagic lesions in the medial temporal lobes and thalamus bilaterally and lesions with ring shape contrast enhancement lesions.

Our case is the first report of hemorrhagic complication in the spinal cord in a patient with Coronavirus infection. Whether it was caused by the neurotropic properties [4] of the virus or secondary to inflammatory reaction in the peri medullary veins. The spinal cord MRI showed no signs of myelopathy or intramedullary hemorrhagic foci. Our patient did not show signs of coagulopathy, blood dyscrasia and she was not on anticoagulants. Further investigations are necessary to rule out the vasculitis hypothesis for the subdural hemorrhagic effusion in this case. The intraoperative was unnoteworthy, after hematoma resection there were not observed any lesions for biopsy and the spinal angiogram ruled out other vascular lesions. Sampogna et al. [5] reported spinal cord complications after COVID-19 infection. From the three cases reported, two patients presented with epidural abscesses and one patient with ischemic lesion from occlusion of the artery of Adamkiewicz secondary to generalized thrombosis. Over the year of 2020, several case reports of Guillain-Barré Syndrome which were associated with SARS-CoV-2 have been published as a potential neurologic complication of viral infections [6-9]. Our report has limitations. We believe that further investigation through spinal MR with vessel-wall study and detailed analysis of the cerebral spinal fluid would add for diagnostic investigation of this spontaneous hemorrhagic effusion in the spinal cord. However, spinal subdural hematoma has not been reported in patients with COVID-19 infection and the spinal cord vasculitis hypothesis has not been addressed in previous papers.

Conclusion

We reported the first description of spinal cord hemorrhagic disease as a complication of Coronavirus infection. The hypothesis of vasculitis of the perimedullary venous system in a setting of hyperinflammatory reaction is reasonable and should be further investigated.

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