

## ISCHEMIC STROKE IN COVID-19 PATIENT: A RARE CASE REPORT.

## General Medicine

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## ABSTRACT

**Background:** COVID-19 is shown to be associated with hypercoagulable state which may cause neurological and cardiovascular complications. COVID-19 has been represented as an independent risk factor for acute ischemic stroke.

**Objective:** We report a case of acute ischemic stroke as a COVID-19 complication.

**Material and methods:** A 62-year-old known hypertensive male was diagnosed with COVID-19. He developed neurological symptoms 10 days after being tested positive. On doing an NC-CT head, a large acute ischemic stroke involving left Middle Cerebral Artery infarct was detected.

**Result and Conclusion:** Our case represents the development of acute ischemic stroke as a neurological manifestation in patient with COVID-19. Early evaluation for acute neurological changes and timely management may reduce morbidity and mortality in such cases.

## KEYWORDS

COVID-19, SARS-COV-2, Stroke.

## INTRODUCTION:

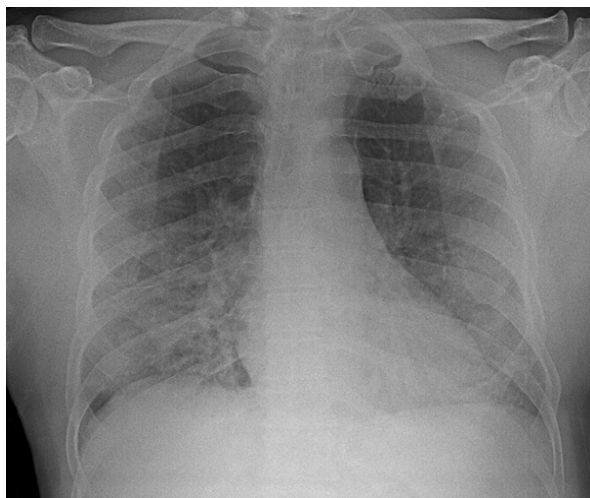
COVID-19 is shown to be associated with hypercoagulable state which may cause neurological and cardiovascular complications.<sup>[1,2]</sup> The neurological symptoms were reported to be approximately 36% in COVID-19 hospitalized patients.<sup>[3]</sup> COVID-19 has been represented as an independent risk factor for acute ischemic stroke.<sup>[4]</sup>

There are very few reported cases of acute stroke in COVID-19 Patients. We had a 62 years male who developed neurological symptoms after 10 days of admission which was due to acute ischemic stroke on NC-CT head.

## Case History:

A 62-year-old male patient, known case of hypertension was admitted at our hospital with complains of fever for 3 days and breathlessness for 2 days.

On presentation, his vitals included pulse 92/min, blood pressure was 146/92mmhg, respiratory rate of 24/min, SpO2 of 86% at room air and temperature of 98.9°F. His GCS was 15. General physical examination was unremarkable. Systemic examination revealed crepitation in bilateral middle and lower lung fields. Rest of the systemic examination was unremarkable.



**Figure 1. Chest X-ray Pavier.: non-homogeneous reticulo nodular opacities in predominant peripheral distribution of bilateral middle and lower zones, with areas of patchy consolidation.**

His chest x-ray PA view revealed non-homogeneous reticulo-nodular opacities in predominant peripheral distribution of bilateral middle and lower zones, with areas of patchy consolidation as shown in Fig.1. His Complete blood count showed WBC count of 12,600/mm<sup>3</sup>, with Neutrophilia and Lymphocytopenia. ESR was raised i.e. 25mm/hr. Details mentioned in Table.1 Patient ABG's revealed Type-1 Respiratory Failure with pH of 7.48, PO<sub>2</sub> of 56mmhg and PCO<sub>2</sub> of 32mmhg.

**Table1: Demographic profile, Clinical profile and laboratory findings of the patient.**

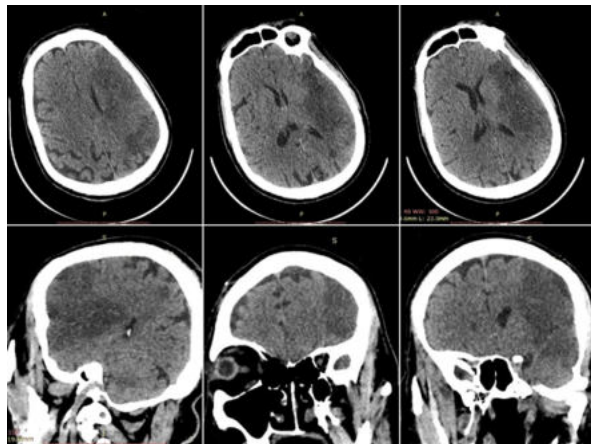
|                                               |                            |
|-----------------------------------------------|----------------------------|
| Age                                           | 62 years                   |
| Sex                                           | Male                       |
| Medical history                               | Hypertension               |
| Symptoms at COVID-19 onset                    | Fever, shortness of breath |
| Day of onset of Stroke after initial symptoms | 14 days                    |
| Haemoglobin                                   | 12.4 mg/dl                 |
| White cell count                              | 12,600/mm <sup>3</sup>     |
| Differential count                            |                            |
| Neutrophil                                    | 10700/ ul                  |
| Lymphocytes                                   | 640/ul                     |
| Platelet Count                                | 1,80,000/ mm <sup>3</sup>  |
| Albumin                                       | 2.8 g/dl                   |
| Alanine aminotransferase                      | 56 U/L                     |
| Aspartate aminotransferase                    | 43 U/L                     |
| Bilirubin (total)                             | 0.8 mg/dl                  |
| Creatinine                                    | 1.1 mg/dl                  |
| Urea                                          | 22 mg/dl                   |
| ESR                                           | 25mm/hr                    |

Patient was started on empirical 3<sup>rd</sup> generation cephalosporin, Favipiravir, prophylactic LMWH, Dexamethasone and non-invasive ventilation.

On the morning of 10<sup>th</sup> day from admission, patient had decreased level of consciousness, inability to speak, deviation of mouth towards to left and inability to move right upper and lower limbs. On examination GCS was E2V1M3 with gaze preference towards left side. Patient had right sided facial paralysis, right sided hemiplegia with right extensor planter reflex. Patient was intubated and mechanically ventilated in view of low GCS.

An urgent NC-CT head was done which revealed evidence of hypodensity involving left fronto-temporoparietal region with loss of grey white matter differentiation causing mild effacement of ipsilateral lateral ventricle indicating a large acute ischemic stroke involving left

Middle Cerebral Artery. Patient was deemed not a candidate for thrombolysis and was treated with aspirin and supportive measures. Patient was on mechanical ventilation which was weaned off after 7 days. Patient's GCS improved over time to E4V5M6 with power of 4/5 in both right upper and lower limb. Patient's RTPCR for COVID-19 came negative after 15 days from admission. Patient was discharged after 18 days from admission with advice for regular follow-up.



**Figure 2. NCCT head:** hypodensity seen involving left fronto-temporoparietal region with loss of grey white matter differentiation causing mild effacement of ipsilateral lateral ventricle indicating large Acute Ischemic Stroke involving Left Middle Cerebral Artery.

#### DISCUSSION:

According to a study of Mao et al., 5.7% of COVID-19 Patients with severe infection developed cerebrovascular disease later in course of illness.<sup>[3]</sup> Stroke is one of these neurological complications.<sup>[3]</sup>

Angiotensin-converting enzyme 2 (ACE-2) is the cellular receptor for severe acute respiratory syndrome– coronavirus and the new coronavirus (SARS-CoV-2).<sup>[5]</sup> This receptor is also present in nervous system and a study speculate that SARS-CoV-2 is neurotropic too.<sup>[6,7]</sup> Direct injury to the blood and blood brain barrier, hypoxic injury, and immune-related injury can also lead neurological involvement.<sup>[7]</sup> Although the exact patho-physiological mechanism is yet to be known.

Our case represents the development of acute ischemic stroke as a neurological manifestation in patient with COVID-19. We therefore imply that serious COVID-19 patients should be evaluated early for acute neurological changes and timely management in such patients may reduce morbidity and mortality.

#### Abbreviations:

COVID-19, Coronavirus disease 2019; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2; WBC, white blood cells; ESR, erythrocyte sedimentation rate; ABG, Arterial blood gas; LMWH, Low Molecular Weight Heparin; NC-CT, Non-contrast Computed tomography; ACE-2, Angiotensin-converting enzyme 2.

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