

COVID-19 and Epilepsy

Amira Sidig (✉ Amirasiddig121@hotmail.com)

Neelain University

Radi Tofaha Alhusseini

Alzaiem Alazhari University

Khabab Abbasher

University of Khartoum

Mohamed Elsayed

University of Ulm

Hussien Abbasher

Al-Yarmouk College

Mohammed Abbasher

Neelain University

Sufian Khalid M. N

Nile Valley University

Khalid Hajnoor

Medi Clinic Hospital

Mohammed Malekaldar

Omdurman Teaching Hospital

Abbasher Hussien

University of Khartoum

Omer Eladil A. Hamid

University of Africa Khartoum-Sudan

Mutaz F. Digna

University of Khartoum

Case Report

Keywords: Epilepsy, seizure, refractory status epilepticus, COVID-19, case report

Posted Date: August 4th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-49340/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Introduction: COVID-19 caused by SARS-CoV-2 acquired via respiratory droplets. It can present with many systemic disorders, including

A 45-year-old Sudanese male known to have well-controlled generalized tonic-clonic epilepsy, He presented to the Accident and Emergency (A&E) department complaining of refractory status epilepticus. Despite immediate initial stabilization, the seizure attacks were still refractory to intravenous loading doses of antiepileptic drugs AEDs. Hence the patient was intubated and mechanically ventilated. Brain MRI and EEG were normal. The chest X-ray was normal. The screening of COVID-19 was positive.

Epilepsy is one of the most common neurological disorders. Since the beginning of the Coronavirus outbreak in December 2019, no available research data is suggesting that the patients with epilepsy are at more risk than others. As no available data relating epilepsy to severe COVID-19 infection (6). Moreover, no data studied COVID-19 and the sudden unexpected death among epileptic patients (SUDEP).

Conclusion: This case might report the effect of SARS-CoV-2 on provoking the refractory seizures in a previously well-controlled patient with epilepsy. More researches are needed to explain the relation between COVID and seizure threshold.

Introduction

Coronaviruses family are important human and animal pathogens. In December 2019, new species of the coronaviruses emerged to the existence in China, the new virus incriminated to cause one of the uttermost pandemics in Humankind history. The World Health Organization (WHO) has designated the disease caused by the severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2] as coronavirus disease 2019 (COVID-19). SARS-CoV-2 transmission among humans primarily thought to occur among close contacts via respiratory droplets generated by sneezing and coughing (1). Common symptoms are fever, sore throat, cough, shortness of breath, diarrhea, and generalized fatigue. Complications of COVID-19 include Acute distress respiratory syndrome, myocarditis, heart failure, renal failure, and recurrent attacks of pulmonary embolism. Recent studies showed that COVID-19 could present with neurological manifestations such as loss of smell and taste, headache, dizziness, peripheral neuropathy, encephalitis, convulsions, and hemiplegia and Guillain-Barre syndrome (1,2,11).

Epilepsy is one of the foremost prevalent neurological disorders. It is a clinical syndrome characterized by recurrent attacks of unprovoked seizures International League Against Epilepsy (ILAE) defines epilepsy "as a disorder of the brain characterized by an everlasting predisposition to epileptic seizures" (3). Aetiologically, epilepsy is either idiopathic or secondary to underlying causes such as brain tumor, trauma, CVA, degenerative diseases, early birth trauma, encephalitis, and meningitis. Most of the epileptic patients are well controlled (70-80%) under the use of antiepileptic drugs. Many factors can trigger epilepsy attack

examples are fever (whatever the underlying cause), cessation of the treatment, high tone music, sleep deprivation, bathing with hot water, and menstrual cycle.

Clinically when a focal group of neurons is affected, this ended up in focal epilepsy, and when both hemispheres are affected than it generalized epilepsy (4). Some seizures might be continuous and ended in what is called Status Epilepticus. The ILAE delineates epilepsy as one convulsion of >30 minutes duration or a series of epileptic seizures with the function not retrieved between ictal events in half-hour time.

The most common causes in adults include acute structural brain injury or tumor, cerebral hypoxia, infection, sepsis, antiseizure drug non-adherence, metabolic abnormalities, or drug interactions (5).

COVID-19 can be persecuted with high-grade fever like other diseases so that it can provoke an attack in an epileptic patient. Thus far, no data supporting that epilepsy can increase the risk of getting COVID- 19, or epilepsy can increase the severity of COVID-19 infection.

Case Report

in 2017 A 45-year-old Sudanese male diagnosed as a case of generalized tonic-clonic epilepsy well-controlled with Levetiracetam 1000 mg per day. The patient presented to The Accident and Emergency (A&E) department complaining of seizure attack which described by his wife as generalized tonic-clonic lasted for 2 minutes; the patient did not regain his consciousness before having another attack. His wife mentioned that he used to take his medication regularly, and preceded by high-grade fever, headache, sore throat, and dry cough. Also, he has a loss of taste and smell. After initial assessment and necessary investigations, further investigations of the status Epilepticus requested. Despite immediate initial stabilization, the attacks were refractory to intravenous loading doses of AEDs, including Benzodiazepines, Phenytoin and Levetiracetam, with low oxygen saturation despite oxygen therapy. Hence intubated and mechanically ventilated. The patient died after ten days on the ventilator.

Brain MRI and EEG were normal. The chest X-ray was normal. The general urine test, blood urea nitrogen, and serum creatinine were all standard. The screening of COVID-19 was positive.

Discussion

Epilepsy is among the foremost prevalent neurological disorders. It can affect children, adults, and, therefore, the elderly. Almost 70-80% of epileptic patients will show remarkable improvement on antiepileptic drugs. Since the beginning of the Coronavirus outbreak in December 2019, there is no available data suggesting an increased risk among patient with epilepsy getting COVID-19. Also, there is no available data suggesting that epilepsy is a risk factor for severe COVID- 19 infections (6).

In certain conditions, as reported by Lu et al. 2020 (7), patients with epilepsy may have severe COVID- 19 infections when associated with a chronic disease like diabetes, renal failure, heart failure, malignancy,

and autoimmune encephalitis. In addition to those with swallowing defect and aspiration pneumonia. Until now, there are still no data studied the association between COVID-19 and the sudden unexpected death among epileptic patients (SUDEP). This case might report the effect of SARS-CoV-2 on provoking the refractory seizures in a previously well-controlled patient. Some shreds of evidence suggested that patients with epilepsy may get recurrent attacks of seizures when infected with COVID-19. The aetiological hypothesis based on the effect of the COVID-19 high-grade fever as a provoking factor (8). Other factors, such as anxiety, panic attacks, and sleep deprivation, might be blamed.

Patients with epilepsy should exercise the same habits and preventive measures that healthy people undertake, such as hand hygiene and avoiding touching body orifices and mucous membranes such as eyes, nose, and mouth. Disinfecting surfaces regularly, avoiding contact with sick people, and keep social distancing (9,10).

Declarations

Conflict of Interest

There are no competing interests.

Consent

The authors certify that the patient consented to publish their case and clinical data.

References

Colaneri M, Sacchi P, Zuccaro V, et al. Clinical characteristics of coronavirus disease (COVID-19) early findings from a teaching hospital in Pavia, North Italy, 21 to 28 February 2020. *Euro Surveill.* 2020.

Amira Siddig, Khabab Abbasher, et al. CASE REPORT COVID-19 and Guillain-Barre Syndrome. *Journal of Neurology and Neurobiology* ISSN 2379-7150 | Open Access.

Fisher RS, Acevedo C, Arzimanoglou A, Bogacz A, Cross JH, Elger CE, Engel J Jr, Forsgren L, French JA, Glynn M, Hesdorffer DC, Lee BI, Mathern GW, MoshéSL, Perucca E, Scheffer IE, Tomson T, Watanabe M, Wiebe S. ILAE official report: a practical clinical definition of epilepsy. *Epilepsia.* 2014;55 (4):475.

Elger CE, Schmidt D. Modern management of epilepsy: a practical approach. *Epilepsy & Behavior.* 2008;12:501–39.

Frank W Drislane, Paul Garcia, Jonathan A Edlow, John F Dashe. Convulsive status epilepticus in adults: Classification, clinical features, and diagnosis <https://www.uptodate.com/contents/convulsive-status-epilepticus-in-adults-classification-clinical-features-and-diagnosis> (accessed 20 June 2020).

Ali A. Asadi-Pooya. Seizures associated with coronavirus infections. *Seizure* 79. 2020; 49-52.

Lu et al. New-onset acute symptomatic seizure and risk factors in Coronavirus disease 2019: A Retrospective multicenter study. *Epilepsia* (2020 Apr) 118.

Kuroda N. Epilepsy and COVID-19: Associations and important considerations. *Epilepsy Behav.* 2020;108:107122.

Naoto Kuroda. Epilepsy and COVID-19: Associations and essential considerations. *Epilepsy Behav.* 2020 22 April: 107122.

Pan L, Wang L, and Huang X. How to Face the Novel Coronavirus Infection During the 2019-2020 Epidemic: The Experience of Sichuan Provincial People's Hospital. *Intensive Care Med* 2020;46:573–575.

Michael S Xydakis, a Puya Dehgani-Mobaraki, c Eric H Holbrook, d Urban W Geisthoff, e Christian Bauer, e Charlotte Hautefort, f Philippe Herman, f Geoffrey T Manley, g Dina M Lyon, b and Claire Hopkinsh. Smell and taste dysfunction in patients with COVID-19