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RESEARCH ARTICLE

EVOLUTION OF EPILEPSY ASSOCIATED WITH COVID-19 IN A TERTIARY PRIVATE HOSPITAL IN NORTHERN MEXICO AFTER THREE YEARS OF THE PANDEMIC

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Abstract

Background: Apart from new-onset seizures due to acute illness, the impact of COVID-19 on patients with pre-existing epilepsy has been immense.

Aims: To study patients after three years of the COVID-19 pandemic in order to assess the prevalence of new-onset seizures resulting from COVID-19 infections, the prevalence of seizure exacerbations in people with epilepsy, and the evolution of epilepsy.

Methods: A descriptive, prospective, observational, and longitudinal study. Inclusion criteria were patients with epilepsy as a presenting symptom of COVID-19 confirmed with Polymerase Chain Reaction (PCR) for SARS-CoV2 by nasopharyngeal swab from March 2020-July 2021 in a tertiary private hospital. Study variables were age, gender, type, and evolution of epilepsy. It was classified into three groups: acute symptomatic seizures, the onset of epilepsy, and uncontrolled epilepsy. Information was captured in Excel and analyzed in SPSS.

Results: Of 203,987 patients with a confirmed diagnosis of COVID-19 in Nuevo León until July 2021, 10 patients (0.004%) were included with seizures. Two patients had acute symptomatic seizures (20%), four patients had new-onset seizures (40%) and four patients (40%) had uncontrolled epilepsy with an average epilepsy evolution time of 15.75 years. Focal seizures were predominant in 63%. After three years of the COVID-19 pandemic in 2023, 75% of patients continued with uncontrolled epilepsy with the use of the antiseizure drug.

Conclusion: Our study shows that there is evidence of the susceptibility of people with COVID-19 to present acute symptomatic seizures, new-onset seizures, and uncontrolled epilepsy, with an unfavorable course of epilepsy continuing with uncontrolled seizures and use of anti-seizure drugs, which agrees with what is reported in the literature.

Keywords: seizures, epilepsy, COVID-19, SARS-CoV-2.

INTRODUCTION:

Since late 2019, the world has been experiencing a catastrophic pandemic of a new coronavirus disease (COVID-19) caused by SARS-CoV2.¹

Coronaviruses primarily target the human respiratory system. However, they have also been associated with neurological manifestations.^{2,3}

Neurotropic and neuroinvasive capabilities of coronaviruses have been described before.⁴

It is reasonable to expect that some patients with COVID-19 develop seizures as a consequence of hypoxemia, organ failure, or metabolic derangements in patients with COVID-19.⁵

On the other hand, information on the susceptibility of people with epilepsy (PWE) to contracting COVID-19 and the consequences and challenges of this catastrophic disease in PWE are scarce.

As for patients with a chronic neurological disorder, a few cohort studies have reported that patients with preexisting neurological disorders who contracted COVID-19 developed more severe clinical symptoms and worse outcomes, compared to the general population.^{6,7}

Another important issue is the occurrence of new-onset seizures in people with COVID-19.

Apart from new-onset seizures due to acute illness, the impact of COVID-19 on patients with pre-existing epilepsy has been immense.

In addition, some patients with neurological disorders who developed COVID-19 had worsening preexisting neurological symptoms.⁸

Ensuring correct follow-up of these patients can prevent decompensations in those at high risk of worsening their seizures.⁹

The objective was to study patients after three years of the COVID-19 pandemic in order to assess the prevalence of new-onset seizures resulting from COVID-19 infections, the prevalence of seizure exacerbations in people with epilepsy, and the evolution of epilepsy.

METHODS:

This was a descriptive, prospective, observational, and longitudinal study.

Inclusion criteria were patients with epilepsy as a presenting symptom of COVID-19 confirmed with Polymerase Chain Reaction (PCR) for SARS-CoV2 by nasopharyngeal swab from March 2020-July 2021 in a tertiary private hospital. The exclusion criteria were files with incomplete data.

Data were obtained from clinical records.

Study variables were age, gender, type, and evolution of epilepsy.

It was classified into three groups: acute symptomatic seizures, the onset of epilepsy, and uncontrolled epilepsy.

We followed them for three years after the COVID-19 pandemic.

We studied whether patients with the onset of epilepsy continued with uncontrolled epilepsy and with the use of anti-seizure drugs after three years of the COVID-19 pandemic.

Information was captured in Excel.

Tests (measures of central tendency: mean, median, average, standard deviation, chi-squared test) were applied in the SPSS program.

RESULTS:

Of 203,987 patients with a confirmed diagnosis of COVID-19 in Nuevo León until July 2021, 10 patients (0.004%) were included with seizures.

The mean age of the studied population was 22.72 years old, DE+_{23.11} (40 days-57 years old). The male gender was predominant with 70%.

Three groups were found: acute symptomatic seizures, the onset of epilepsy, and uncontrolled epilepsy.

Two patients had acute symptomatic seizures (20%), four patients had new-onset seizures (40%) and four patients (40%) had uncontrolled epilepsy with an average epilepsy evolution time of 15.75 years.

Regarding the type of epilepsy, focal seizures were predominant in 63%.

80% of patients required antiepileptic after hospital discharge.

After three years of the COVID-19 pandemic in 2023, 75% of patients continued with uncontrolled epilepsy with the use of the antiseizure drug.

Association was found between severe COVID-19 and uncontrolled epilepsy and between pre-existing epilepsy and uncontrolled epilepsy with statistical significance ($p < 0.05$).

DISCUSSION:

There is evidence of the susceptibility of people with COVID-19 to present acute symptomatic seizures, new-onset seizures, and uncontrolled epilepsy.¹⁰

Seizures in COVID-19 may happen as a consequence of hypoxia, metabolic derangements, organ failure, medications, or brain damage that could occur in people with COVID-19.^{11,12}

If a patient with COVID-19 develops a seizure, one should try to determine the etiology of the seizure and manage the cause (e.g., hypoxia and metabolic derangements) immediately.

Another important issue is the occurrence of new-onset seizures in people with COVID-19. While seizure is not a common manifestation of COVID-19, it may happen in a variety of forms (e.g., focal motor, tonic-clonic, convulsive status epilepticus, and nonconvulsive status epilepticus).¹³⁻²⁰

In addition, it is often necessary to start an antiseizure medication (ASM) for a patient with COVID-19 and seizures to abort prolonged seizures and prevent further seizures.²¹ It should be emphasized that patients with acute symptomatic seizures do not need long-term ASM therapy after the period of acute illness unless a subsequent seizure happens.²²

A recent systematic review suggested that patients with pre-existing neurological disorders (including epilepsy) and COVID-19 may develop exacerbation of their neurological problems and also severe COVID-19.²³

A study of 227 PWE during the SARS outbreak in 2003 in Taiwan demonstrated that 22% of them did not receive their medications due to loss of contact with their healthcare providers; 12% of them experienced worsening the seizure control status.²⁴

Many PWE may have increased stress and social isolation, even more than that in others, during such circumstances as the COVID-19 pandemic.

Patients with epilepsy and COVID-19 may present somewhat differently than others with such an illness. Why PWE is less often present with cough and more often present with gastrointestinal symptoms is not clear yet and should be investigated and clarified in future studies.²⁵

Likewise, few studies talk about the evolution of epilepsy associated with COVID-19 over time.

Our study found that after 3 years of follow-up in 2023, there was an unfavorable course of epilepsy, continuing with uncontrolled seizures and the use of anti-seizure drugs, which agrees with what is reported in the literature.²⁶

Also, we found an association between severe COVID-19 and uncontrolled epilepsy and between pre-existing epilepsy and uncontrolled epilepsy.

In a systematic review, the findings suggest that COVID-19 may increase the risk of a worsening of neurological symptoms in patients with preexisting neurological disorders by 31.9%.²⁷⁻²⁹

Clinicians should be aware of the risk of symptom exacerbation and severe COVID-19 in patients with preexisting neurological disease and should focus on the prevention and early care of COVID-19.³⁰

CONCLUSIONS:

The coronavirus disease 2019 (COVID-19) pandemic represented a relevant issue for PWE. Medical care and social restrictions exposed PWE to a high risk of seizure worsening. Medical institutions answered to the pandemic by assuring only emergency care and implementing remote assistance that highlighted the technological obsolescence of the medical care paradigms for PWE.

Our study shows that there is evidence of the susceptibility of people with COVID-19 to present acute symptomatic seizures, new-onset seizures, and uncontrolled epilepsy, with an unfavorable course of epilepsy continuing with uncontrolled seizures and use of anti-seizure drugs and with risk of a worsening of neurological symptoms in patients with preexisting neurological disorders.

The consequences of this catastrophic disease in PWE are still scarce.

This significant concern should be addressed in the future through well-designed prospective cohort studies with all relevant confounders controlled.

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Conflict of interest:

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