

# 코로나19와 뇌전증



## 문 장 섭

서울대학교병원 희귀질환센터 신경과

## COVID19 and Epilepsy

Jangsup Moon, MD, PhD

Rare Disease Center, Department of Neurology, Seoul National University Hospital

### Contents

- Does COVID-19 cause seizure/epilepsy?
- Important considerations for patients with epilepsy in COVID-19 era

### Does COVID-19 cause seizure/epilepsy?

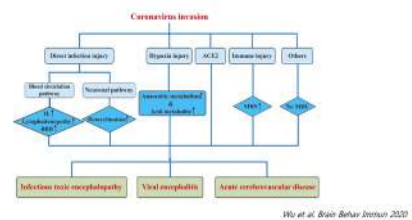
### COVID-19 and Seizure (Case reports)

- Pubmed: "COVID-19" and "Seizure"  
– 193 articles (by 2020-10-24)



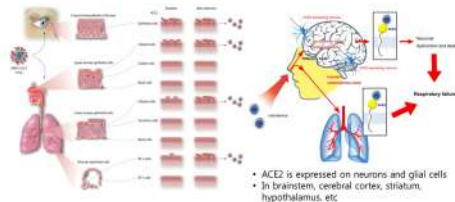
### CNS complications

- The neurological symptoms associated with COVID-19 include headache, dizziness, depression, anosmia, encephalitis, stroke, **epileptic seizures**, Guillain-Barre syndrome, etc
- The involvement of the CNS may be related with poor prognosis and disease worsening



## Pathomechanism of CNS complication

- SARS-CoV2 uses angiotensin-converting enzyme2(ACE2) as receptor for docking and cell entry



Xu et al. Cell Mol Neurobiol 2020

## COVID-19 and Seizure (Case Series)

### Neurologic manifestations in hospitalized patients with COVID-19

The JAMA COVID registry

	Total, n = 841	Neurologic, n = 152 (18.1%)	Seizure, n = 120 (15.8%)	OR	95% CI	p Value
Age	483 (57.4)	178 (21.5)	120 (15.8)	1.00	1.2-1.3	0.001
Neurologic symptoms	140 (16.7)	140 (100.0)	140 (100.0)	0.00	0.00-0.00	0.001
Headache	170 (20.2)	170 (100.0)	170 (100.0)	0.00	0.00-0.00	0.001
Dizziness	170 (20.2)	170 (100.0)	170 (100.0)	0.00	0.00-0.00	0.001
Seizure	120 (14.3)	120 (100.0)	120 (100.0)	0.00	0.00-0.00	0.001
Respiratory failure	120 (14.3)	120 (100.0)	120 (100.0)	0.00	0.00-0.00	0.001
Neurologic symptoms	140 (16.7)	140 (100.0)	140 (100.0)	0.00	0.00-0.00	0.001
Any	140 (16.7)	140 (100.0)	140 (100.0)	0.00	0.00-0.00	0.001
Neurologic symptoms	140 (16.7)	140 (100.0)	140 (100.0)	0.00	0.00-0.00	0.001
Any	140 (16.7)	140 (100.0)	140 (100.0)	0.00	0.00-0.00	0.001
Seizure	120 (14.3)	120 (100.0)	120 (100.0)	0.00	0.00-0.00	0.001
Seizure	120 (14.3)	120 (100.0)	120 (100.0)	0.00	0.00-0.00	0.001

- 841 hospitalized COVID-19 patients were analyzed (Spain)
- 57.4% developed some form of neurologic symptoms
- Seizure occurred in 0.7% of patients

Romero-Sanchez et al. Neurology 2020

## COVID-19 and Seizure (Case Series)

### A systematic review of neurological symptoms and complications of COVID-19

- 92 full-text publications were analyzed (Accepted: Jul 2020)
- Headache, dizziness, taste and smell dysfunctions, and impaired consciousness were the most frequently described neurological symptoms

Table 1. Summary of frequent neurological symptoms reported in COVID-19 patients

	Total	Mild or moderate	Severe or critical
n-studies	n (n/N)	n-studies	n (n/N)
Headache	31	30 (96.8%)	24
Dizziness	13	13 (100.0%)	5
Headache or dizziness	8	7 (87.5%)	5
Smell dysfunction	6	6 (100.0%)	1
Taste dysfunction	6	6 (100.0%)	1
Impaired consciousness	9	9 (100.0%)	4

- Generalized seizures were reported in 2 case reports
- 7 single-case reports on meningitis/encephalitis in association with COVID-19 have been published (some reported seizures)

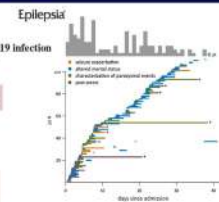
Chen et al. J Neurol 2020

## COVID-19 and Seizure (Case Series)

### Continuous EEG findings in patients with COVID-19 infection admitted to a New York academic hospital system

TABLE 2. Continuous EEG findings

	Total (N = 111)	Excluding post-ictal (N = 100)
Seizures recorded on EEG	6 (7.2%)	5 (5.0%)
No clinical signs	2 (2.0%)	1 (1.0%)
Subtle clinical signs	3 (3.0%)	3 (3.0%)
NCSE	2 (2.0%)	1 (1.0%)
Any epileptogenic abnormalities (foci, PEOs or seizures)	30 (31.5%)	30 (30.0%)



- 111 COVID-19 patients who underwent continuous EEG monitoring (USA)
- Male (71%), ICU admission (77%), comatose (70%)
- Epileptiform discharges were observed in 30% and seizures in 7%

Pollanen et al. J Epilepsia 2020

## Important considerations for patients with epilepsy in COVID-19 era

## Do Epilepsy patients have higher risk for COVID-19?

- "Neurological comorbidities (including epilepsy) may be a risk factor for COVID-19"
- Suggested by CDC, without any evidence
- To date, history of epilepsy has not been reported to be a risk factor for COVID-19
- Epilepsy itself seems unlikely to be a risk factor for COVID-19
- Immunomodulatory drugs, steroid may increase the risk of infectious disease

## Effect of COVID-19 on patients with epilepsy

- **Changing AEDs** in patients with well-controlled seizure are **not recommended**
  - Seizure exacerbation or SE may increase the risk of COVID-19
- Patients should **avoid running out of AEDs**
  - Going to ER may expose the patient to COVID-19
- Do COVID-19 increase the risk of **SUDEP**?
  - Some reports suggest that infections might increase the risk of SUDEP
  - **No data** on the association between COVID-19 and SUDEP, until now

*Kuruda et al. Epilepsy Behav. 2020*

- Kavada et al.
- Epilepsy Behav*
- 2020;

[illegible]

## Epilepsy monitoring units and Surgery

- During the serious pandemic of COVID-19, **Video-EEG monitoring & Elective surgical treatments** for epilepsy **may be postponed** to prevent further spread of COVID-19 among medical staff and patients
- However, some patients have progressive condition of epilepsy
- The real risk of proceeding and the real risk of delay on intervention should be considered **case by case**

*Kuruda et al. Epilepsy Behav 2020*

- Navarro et al. Ecology Behavior 2019,*

# Impact of COVID-19 on Epilepsy care (Survey)

• 337 respondents of American Epilepsy Society members

During the current pandemic, among people with epilepsy (PWE) who are not infected by COVID-19, how are you treated, on average?

Treatment Change	Approximate Count
No change in treatment	140
Increased frequency of visits	60
Decreased frequency of visits	20
Other	10

What is the status of treatment for all patients? (Select all that apply)

Treatment Change	Approximate Count
No change in treatment	140
Increased frequency of visits	60
Decreased frequency of visits	20
Other	10

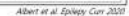
What are the following barriers to care if you have your patients (PWE) hospitalized as a result of the COVID-19 pandemic? (Select all that apply)

Barrier	Approximate Count
Lack of resources	140
Lack of information	100
Lack of access to care	80
Lack of insurance	40
Lack of transportation	20
Lack of social support	10
Lack of financial resources	10

How are you most medication changes in your practice or board of State in your region during the COVID-19 pandemic?

Medication Change	Approximate Count
No change	140
Increase	60
Decrease	20

Albert et al. Epilepsy Care 2020



## Other studies...

Neurological Sciences  
 https://doi.org/10.1016/j.neu.2020.05.024  
 COVID-19

Is Covid-19 lockdown related to an increase of accesses for seizures in the emergency department? An observational analysis of a paediatric cohort in the Southern Italy

Subgroups in emergency department	Study population	P-value
	9969	2019
All accesses to the ED	3669	100%
n. Seizure patients	459	12.5%
n. In-hospital patients	101	21.9%
n. Outpatients	426	23.7%
n. Initial emergency	1266	48.2%
n. Revisits	37	1%
Non-emergency patients	36	0.7%
n. Emergency or non-emergency patients	37	1%
n. Non-emergency patients	1	0.003%
Emergency patients	459	45.9%
Emergency patients	459	45.9%
Emergency of non-emergency patients	459	45.9%
Emergency of non-emergency patients	459	45.9%

- During Italian lockdown, prevalence of seizures increased among ER Adm  
 → Difference in daily screen time (DST) ( $p = 0.0001$ ) and total sleep time (TST) ( $p = 0.045$ )
- Sleep time change and/or higher mobile media devices → could act as triggers for seizures → increased visit to ER

*Palladini et al. Neurosci 2020*



## Summary

- COVID-19 can cause CNS complications
- Seizure is not the major manifestation of the CNS complication
- Seizure or EEG abnormalities (epileptiform discharges) may occur more often in severely-ill COVID-19 patients
- Epilepsy seems unlikely to be a risk factor for COVID-19
- Changing AED in well-controlled patients is not recommended during the COVID-19 pandemic
- EIAEDs may reduce the blood level of some COVID-19 drugs
- Accessibility to medical service may be reduced in patients with epilepsy during the COVID-19 pandemic

- 대한신경과학회 2020년도 제39차 추계학술대회 - 강의를록 -