Risk of COVID-19 Infection and of Severe Complications Among People With Epilepsy
A Nationwide Cohort Study

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Study Question
Do the susceptibility of coronavirus disease 2019 (COVID-19) infection and the risk of severe complications after COVID-19 infection increase in patients with epilepsy compared to those without epilepsy?

What Is Known and What This Paper Adds
Research has shown that the presence and number of underlying comorbidities are associated with the risk of COVID-19 infection or its severity. However, studies on epilepsy and COVID-19 are still limited. This study shows that the susceptibility to COVID-19 infection and mortality are not increased in patients with epilepsy, although the risk of severe complications is higher than in those without epilepsy.

Methods
For this observational cohort study, the investigators analyzed the nationwide COVID-19 dataset in South Korea, which included participants who underwent at least 1 severe acute respiratory syndrome coronavirus 2 real-time reverse-transcription PCR (RT-PCR) test between January 1 and June 4, 2020. Patients with epilepsy were defined according to the presence of diagnostic code and prescription of antiepileptic drugs before the COVID-19 diagnosis in the Korean Healthcare Claims Database. To investigate the association between epilepsy and the susceptibility for or severe complications of COVID-19, a 1:6 ratio propensity score matching (PSM) and logistic regression analysis were performed. Infection with COVID-19 was determined by the positive RT-PCR result from a nasopharyngeal swab sample. Severe complications from COVID-19 infection were defined as a composite of the incidence of mechanical ventilation, intensive care unit admission, and death within 2 months after COVID-19 diagnosis.

Results and Study Limitations
Among 212,678 study participants who underwent a COVID-19 test, 3,919 (1.8%) had a history of epilepsy. After PSM, individuals with epilepsy did not have higher COVID-19 susceptibility (odds ratio [OR] 0.86, 95% CI 0.67–1.11). Of the 7,713 individuals with confirmed COVID-19 infection, 72 (0.9%) had a history of epilepsy. Among the patients with COVID-19, severe complications occurred in 444 (5.8%) individuals. Patients with COVID-19 with epilepsy were at higher risk for severe complications than those without epilepsy (OR 2.05, 95% CI 1.04–4.04). Mortality after COVID-19 infection did not differ according to the presence of epilepsy history (OR 1.55, 95% CI 0.65–3.70).

This study has the limitations of an observational cohort design that could not prove causal relationship, and our findings need to be reaffirmed in different national environments such as ethnic composition or access to health care.

Study Funding and Competing Interests
This study was funded by the National Research Foundation of Korea. The authors report no additional competing interests. Go to Neurology.org/N for full disclosures.
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