


## MINI COMMENTARY

# Seizures may be an early sign of acute COVID-19, and the Omicron variant could present a more epileptogenic profile

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Neurological complications have been associated with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), but have been rare in paediatric patients.<sup>1</sup> However, Ludvigsson's paper,<sup>2</sup> based on three children admitted to a Swedish hospital in January 2022, suggested that seizures may be a frequent and early sign of the Omicron variant in children with acute infections. We also observed an unexpected increase in hospitalisations for seizures in January 2022 in the Pediatric Neurology Unit of the tertiary V Buzzi Children Hospital in Milan.

We retrospectively studied children who were hospitalised with COVID-19 and epileptic seizures from the start of the pandemic until 31 January 2022.

From March to December 2020, 82 children were admitted with acute COVID-19 and 7 (9%) had seizures (Figure 1), and in 2021, it was 84 admissions and 4 (5%) with seizures. In January 2022, 62 children who tested positive for the Omicron variant were hospitalised and 13 (21%) had seizures.

The Omicron 13 admissions in January 2022 (nine boys) had a mean age of 4.7 (range 0.2–17) years and showed mild clinical impairment, including fever and upper respiratory tract infections

(Figure 1). The seizures presented during fevers in 11/13 (85%) children. Three were less than a year old, five were 1–5 years, and the other five were older.

Three had a previous history of epilepsy, two with febrile convulsions and one with seizures. Six had a family history of epilepsy, four with febrile convulsions and two with epilepsy. Five seizures had tonic-clonic generalised crises, three typical and one atypical crisis and four absences, focal crises. Three children had one crisis, five had 2–3, and five had more than three.

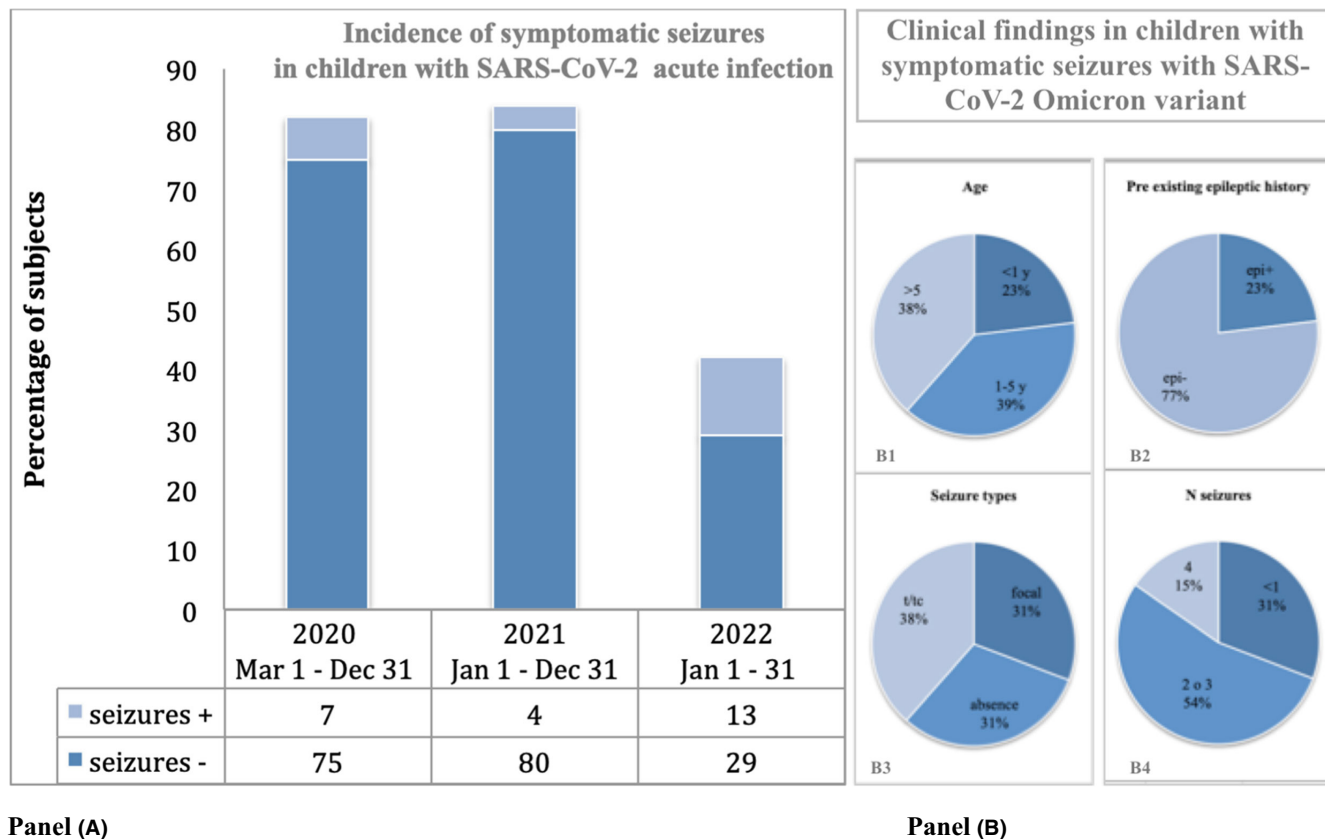
Electroencephalograms were performed on all 13 patients in the first 24 h following the first crisis, and two underwent neuroimaging, which did not show acute encephalopathy.

The number of children hospitalised for COVID-19 in just January 2022 appeared to be disproportionately higher than in 2020 and 2021 and one-third had epileptic seizures. This was much higher than previously reported<sup>3–5</sup> and appears to be related to the Omicron variant.

These data support the hypothesis that seizures may be an early sign of an acute SARS-CoV-2 infection. The Omicron variant could have a more epileptogenic profile, which leads to the onset of seizures or their occurrence in patients with a previous history of epilepsy.

**Abbreviation:** SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

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**Panel (A)** Incidence of patients with acute COVID-19 with (seizures+) and without (seizures-) seizures **Panel (B)** Clinical findings in children with acute COVID-19 and seizures in January 2022. (B1) Percentage of children under 1 year old, 1–5 years old and more than 5 years old. (B2) Percentage of children with (yes) or without (no) pre-existing epileptic history. (B3) Seizure type: T, tonic; TC, tonic-clonic; (B4) number of seizures

**CONFLICT OF INTEREST**

The authors have no conflicts of interest to declare.

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