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Letter to the editor

Response to Frequency of new seizures after SARS-CoV-2 infections may depend on the length of follow-up

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We are grateful for the interest expressed by Dr Finsterer and co-authors in our article. First, we want to emphasize that the study described is an epidemiological one – attempting to describe the incidence of epilepsy among those infected compared to an age-and sex-matched population sample in the years preceding the pandemic. The outcome was occurrence of a G40 ICD code: a validated administrative definition of epilepsy [1]. Indeed, the specificity increases if the ICD-10 code is combined with a prescription of an antiseizure medication [2] but the incidence of epilepsy in the control group is at the expected level, suggesting that the method has worked adequately. The code is typically not used for acute symptomatic seizures, so we do not agree with the line of argument about confounding due to treatment-induced seizures. As we could not detect an increased risk of epilepsy at the whole-group level, any such effect is likely small.

The other issues raised by Dr Finsterer relate to the fact that Covid-19 can cause brain lesions and therefore epilepsy. This is indeed the case, as already discussed in our article, but given that the majority of the population in many western countries have had covid [3], we should be careful to assign causality to apparently temporal relations between a history of infection and seizures in the years to follow. What we have investigated is the effect of the pandemic on epilepsy incidence on an epidemiological level – which seems to be small. This does not mean that a Covid-19 infection can never cause epilepsy.

We also agree and discuss in the paper that, given the relatively short follow-up, our study cannot exclude long-term increased risks of epilepsy as there is a theoretical possibility of aggregate effects of brain insults on the risk of epilepsy. However, other acquired epilepsies, in particular those that related to acute infections affecting the CNS [4], peak in incidence soon after the insult (months to one year). This means that the difference between exposed and non-exposed is most easily detected during the first year of follow-up, given that the total number of person-years is large enough for the statistical power needed. Hence, we believe that direct effects should have manifested during the follow-up period in our study. However, longer-term risks of epilepsy after Covid-19 is an issue that will have to be revisited.

Dr Finsterer and co-authors also suggest that adjustments for more co-morbidities would have been valuable. Since we could not detect an increased risk of epilepsy after Covid-19 in the younger age groups – which are least likely to have their risk modified by co-morbidities – we are not convinced that this approach would give additional clarity.

Declaration of Competing Interest

J.Z. reports honoraria from UCB and Eisai for non-branded educations, and as employee of Sahlgrenska university hospital (no personal compensation) being investigator in clinical trials sponsored by UCB, SK-life science, GW Pharma, and Bial.

References

[1] Sveinsson O, Andersson T, Carlsson S, Tomson T. The incidence of SUDEP: a nationwide population-based cohort study. Neurology 2017;89:170–7.
[2] Mbizvo GK, Bennett KH, Schnier C, Simpson CR, Duncan SE, Chin RFM. The accuracy of using administrative healthcare data to identify epilepsy cases: a systematic review of validation studies. Epilepsia 2020;61:1319–35.
[3] Clarke KEN, Jones JM, Deng Y, Nycz E, Lee A, Iachan R, Gundlapalli AV, Hall AJ, MacNeil A. Seroprevalence of infection-induced SARS-CoV-2 antibodies - United States, September 2021-February 2022. MMWR Morb Mortal Wkly Rep 2022;71:606–8.
[4] Zelano J, Westman G. Epilepsy after brain infections in adults: a register-based population-wide study. Neurology 2020.

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