Appendix 1. Risk of bias assessment

Risk assessment domains for case reports:

Q1: Were the patient's demographic characteristics clearly described?
Q2: Was the patient's history clearly described and presented as a timeline?
Q3: Was the current clinical condition of the patient on presentation clearly described?
Q4: Were diagnostic tests or assessment methods and the results clearly described?
Q5: Was the intervention(s) or treatment procedure(s) clearly described?
Q6: Was the post-intervention clinical condition clearly described?
Q7: Were adverse events (harms) or unanticipated events identified and described?
Q8: Does the case report provide takeaway lessons?

Risk assessment domains for retrospective studies:

Q1: Was the research question or objective in this paper clearly stated?
Q2: Was the study population clearly specified and defined?
Q3: Was the participation rate of eligible persons at least 50%?
Q:4 Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?
Q5: Was a sample size justification, power description, or variance and effect estimates provided?
Q6: For the analyses in this paper, were the exposure(s) of interest measured prior to the outcome(s) being measured?
Q7: Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed?
Q8: For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g., categories of exposure, or exposure measured as continuous variable)?
Q9: Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?
Q10: Was the exposure(s) assessed more than once over time?
Q11: Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?
Q12: Were the outcome assessors blinded to the exposure status of participants?
Q13: Was loss to follow-up after baseline 20% or less?
Q14: Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?

Table 1. Risk of bias Assessment for case reports.

Author	Title	Study Type	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Rostami, et al. (1)	Acute necrotizing encephalopathy with SARS-CoV-2 RNA confirmed in Cerebrospinal fluid	Case report	NO	YES	YES	YES	NO	YES	N/A	NO
Al-olama, et al. (2)	COVID-19-associated meningoencephalitis complicated with intracranial hemorrhage: a case report	Case report	NO	YES	YES	YES	NO	NO	NO	YES
Mardani, et al. (3)	COVID-19 infection recurrence presenting with meningoencephalitis	Case report	NO	YES	YES	YES	NO	NO	NO	YES
Westhoff, et al. (4)	Allograft infiltration and meningoencephalitis by SARS-CoV-2 in a pancreas-kidney transplant recipient	Case report	NO	YES	YES	YES	NO	YES	YES	YES
Huang, et al. (5)	SARS-CoV-2 Detected in Cerebrospinal Fluid by PCR in a Case of COVID-19 Encephalitis + Meningoencephalitis without respiratory failure in a young female patient with COVID-19 infection in Downtown Los Angeles, early April 2020	Case report	NO	NO	YES	YES	NO	NO	YES	YES
Cebrián, et al. (6)	Headache and impaired consciousness level associated with SARS-CoV-2 in CSF: A case report	Case report	NO	YES	YES	YES	NO	YES	YES	YES
Domingues, et al. (7)	First case of SARS-COV-2 sequencing in cerebrospinal fluid of a patient with suspected demyelinating disease	Case report	YES	YES	YES	YES	NO	YES	NO	YES
Moriguchi, et al. (8)	A first case of meningitis/encephalitis associated with SARS-Coronavirus-2	Case report	NO	YES	YES	YES	YES	YES	NO	YES
Fadakar, et al. (9)	A First Case of Acute Cerebellitis Associated with Coronavirus Disease (COVID-19): a Case Report and Literature Review	Case report	NO	YES	YES	YES	YES	YES	NO	YES
Demirci Otluoglu, et al. (10)	Encephalomyelitis associated with Covid-19 infection: case report	Case report	NO	YES	YES	YES	YES	YES	NO	YES

N/A= Not available

Table 2. Risk Assessment of cohort studies.

Authors	Title	Study Type	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14
Helms, et al. (11)	Delirium and encephalopathy in severe COVID-19: a cohort analysis of ICU patients	Prospective Cohort	YES	YES	CD	YES	NO	YES	YES	NO	YES	NO	YES	NO	CD	YES
Kremer, et al. (12)	Brain MRI Findings in Severe COVID-19: A Retrospective Observational Study	Retrospective Cohort	YES	YES	CD	YES	NO	YES	CD	NO	YES	NO	YES	NO	CD	NO
Destras, et al. (13)	Systematic SARS-CoV-2 screening in cerebrospinal fluid during the COVID-19 pandemic	Retrospective Cohort	NO	YES	NR	NO	NO	NA	NO	NO	NO	NO	NO	NR	NO	NO

CD = Cannot determine.

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4. Westhoff TH, Seibert FS, Bauer F, Stervbo U, Anft M, Doevelaar AAN, et al. Allograft infiltration and meningoencephalitis by SARS-CoV-2 in a pancreas-kidney transplant recipient. Am J Transplant. 2020.
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6. Cebrián J, Gonzalez-Martinez A, García-Blanco MJ, Celdrán-Vivancos D, Palacios EL, Reig-Roselló G, et al. Headache and impaired consciousness level associated with SARS-CoV-2 in CSF: A case report. Neurology. 2020;95(6):266-8.
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11. Helms J, Kremer S, Merdji H, Schenck M, Severac F, Clere-Jehl R, et al. Delirium and encephalopathy in severe COVID-19: a cohort analysis of ICU patients. Crit Care. 2020;24(1):491.
12. Kremer S, Lersy F, de Sèze J, Ferré JC, Maamar A, Carsin-Nicol B, et al. Brain MRI Findings in Severe COVID-19: A Retrospective Observational Study. Radiology. 2020:202222.
13. Destras G, Bal A, Escuret V, Morfin F, Lina B, Josset L. Systematic SARS-CoV-2 screening in cerebrospinal fluid during the COVID-19 pandemic. The Lancet Microbe. 2020.