



# NEUROPSYCHIATRIC COMPLICATIONS OF COVID-19

## FROM THE UK-WIDE CORONERVE STUDY: DIVERSE PRESENTATIONS ILLUSTRATED BY CASE VIGNETTES

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### BACKGROUND AND METHODS

- Neurological and psychiatric complications of COVID-19 are being increasingly reported<sup>1-3</sup> and comprehensive characterisation of clinical syndromes is crucial to allow rational selection and evaluation of potential therapies.
- The CoroNerve surveillance study was developed as an online network of secure rapid-response case report notification portals across the spectrum of major UK neuroscience bodies, including the Association of British Neurologists, the British Association of Stroke Physicians & the Royal College of Psychiatrists<sup>1</sup>.
- Here we present four selected representative neuropsychiatry cases from our preliminary data to explore the full clinical details provided by referring clinicians comprising cases of new onset 1) psychosis, 2) catatonia, 3) neurocognitive disorder and 4) mania.

#### CASE 1: PSYCHOSIS

Patient A was admitted to the Emergency Department (ED) after being found on the floor, having not eaten or drunk for several days. They had become increasingly paranoid, believing that their thoughts were being interfered with. They were teetotal with a history of harmful alcohol use 20 years prior. In the week prior, they reported anosmia but no cough or temperature.

- **Initial admission:** In ED, the patient was malodorous with evidence of self-neglect. They were speaking to themselves, emotionally labile and agitated, posturing and squatting in odd positions. Their CT brain was normal; however a SARS-CoV-2 PCR returned positive.
- **Psychiatric admission:** They were detained under the Mental Health Act (MHA). In the mental health unit (MHU), they were thought disordered, with persecutory delusions, delusions of reference, auditory and olfactory hallucinations. Their delusions became increasingly systematised, including a belief that their old manager had led a conspiracy to monitor them, reportedly smelling burning when he was “watching”.
- **Management:** Despite olanzapine 2.5mg OD (PO) they became increasingly agitated, requiring admission to a psychiatric intensive care unit. With up-titration, their psychotic symptoms gradually resolved.
- **Discharge:** Repeat SARS-CoV-2 PCR was positive, but they were well enough to be discharged home and have remained relapse free.

#### CASE 2: CATATONIA

Patient B was admitted to a MHU for a severe depressive episode. They were transferred to the MHU from an acute hospital, where they had been treated for pneumonia, a severe acute kidney injury and a brief episode of delirium. They first exhibited depressive symptoms 4 months prior, which included somatoform delusions about their bowel function.

- **Psychiatric admission:** At the MHU, they had nihilistic delusions and exhibited mutism, posturing, rigidity, immobility, staring, stereotypies, negativism, and withdrawal. They were diagnosed with catatonia, scoring 8/14 on the Bush-Francis Catatonia screening scale.
- **Management:** Lorazepam 0.5mg TDS (IM) was started, resulting in a rapid improvement. A combination of aripiprazole 7.5mg OD (PO) and mirtazapine 45mg ON (PO) improved their mood symptoms.
- **Hospital readmission:** 3 days later, they developed a fever and positive SARS-CoV-2 PCR, requiring transfer back to the acute hospital. Considering the incubation period of COVID-19<sup>4</sup>, it is likely to be implicated in the aetiology of their catatonia.
- **Discharge:** They were discharged with Home Treatment Team follow up.

#### CASE 3: NEUROCOGNITIVE DISORDER

Patient C, with no notable past medical history, presented to ED with a fever and productive cough. They returned 4 days later requiring resuscitation.

- **Initial admission:** SARS-CoV-2 PCR returned positive and 6 days after admission they developed right sided sensory loss and blurred vision, fluctuating levels of consciousness and ataxia. MRI brain scan showed ischaemic infarcts and CT angiogram showed reduced flow in the posterior cerebral and inferior cerebellar arteries. COVID-19 related CNS vasculitis and stroke was diagnosed and they received 3 days of methylprednisolone 1g OD (PO).
- **Psychiatric admission:** After a month, liaison psychiatry were asked to review the patient's low mood and anorexia, prescribing citalopram. They were re-referred 10 days later for verbal and physical aggression with sexualised behaviour and labile mood. They scored 12/30 on the Montreal Cognitive Assessment (MoCA), with particular deficits in orientation and memory.
- **Management:** Citalopram was discontinued and olanzapine commenced. Over the next two weeks, their affective and psychotic symptoms subsided, and the olanzapine was gradually withdrawn, however, their cognitive function did not return to baseline.
- **Discharge:** After a further 5 weeks of neurorehabilitation they were discharged home. Although their behaviour, motor and cognitive function had improved, residual short-term memory loss remained.

#### CASE 4: MANIA

Patient D presented to ED with confusion, following two weeks of lethargy, cough, pyrexia and insomnia. Their partner reported that they had been behaving oddly in the weeks prior, writing incoherent lists, with high energy levels, racing thoughts and labile mood. They had one depressive episode 20 years prior but no other past psychiatric history. They had a medical history of well controlled multiple sclerosis.

- **Psychiatric assessment:** Liaison psychiatry found them to be manic, with tangential speech, elevated mood, grandiose and persecutory delusions related to God, Florence Nightingale and the Queen, auditory hallucinations including command hallucinations to commit suicide, sexual disinhibition and insomnia. It was felt that COVID-19 infection may have precipitated this first manic episode.
- **Management:** They were admitted to an out of area MHU and commenced on Risperidone.
- **Discharge:** No further information is available about their recovery.

### CONCLUSION

- Infection with COVID-19 has been shown to exacerbate pre-existing psychiatric conditions or result in de novo psychiatric syndromes, including psychosis, cognitive disorder, mania and catatonia. Further work is ongoing to explore the mechanisms by which SARS-CoV-2 infection can lead to the emergence of these neuropsychiatric syndromes as well as the other neurological manifestations reported in the CoroNerve study.
- This study highlights the impact of this respiratory virus on the central nervous system, the often-severe impact on patients' lives, and the necessity for multidisciplinary involvement across the neurosciences in managing this patient group.