

A Curious Case of Collegiate COVID Psychosis

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Introduction

- A growing number of case reports have established the link between COVID-19 and psychosis^{3,6}.
- **Typical features** of the psychosis as described in the literature include: short duration of illness, mostly positive symptoms, often with associated delirium and/or elevated inflammatory markers, and response to low doses of antipsychotics^{3,6}.
- We present a case **divergent** from these typical findings.

Case

- **Patient:** 19-year-old female college student
- **History:** no personal or family psychiatric illness, no recent substance use, but recent COVID-19 diagnosis
- **Presentation:** acute onset of psychotic symptoms (auditory and visual hallucinations, delusions, paranoia, disorganized speech/behavior, and withdrawal). No associated prodromal period.
- **COVID-19 illness:** Psychotic symptoms started about 4 days into her mild COVID-19 illness. COVID-19 symptoms included mild cough, low-grade fever, anosmia, memory lapses. No associated delirium.
- **Workup:** no elevation in C-reactive protein or ferritin. Urine drug screen and synthetic cannabinoid screen were negative
- **Outcome:** The patient started to improve once risperidone had been titrated to 5 mg nightly, and she was discharged at her psychiatric baseline on hospital day 10.

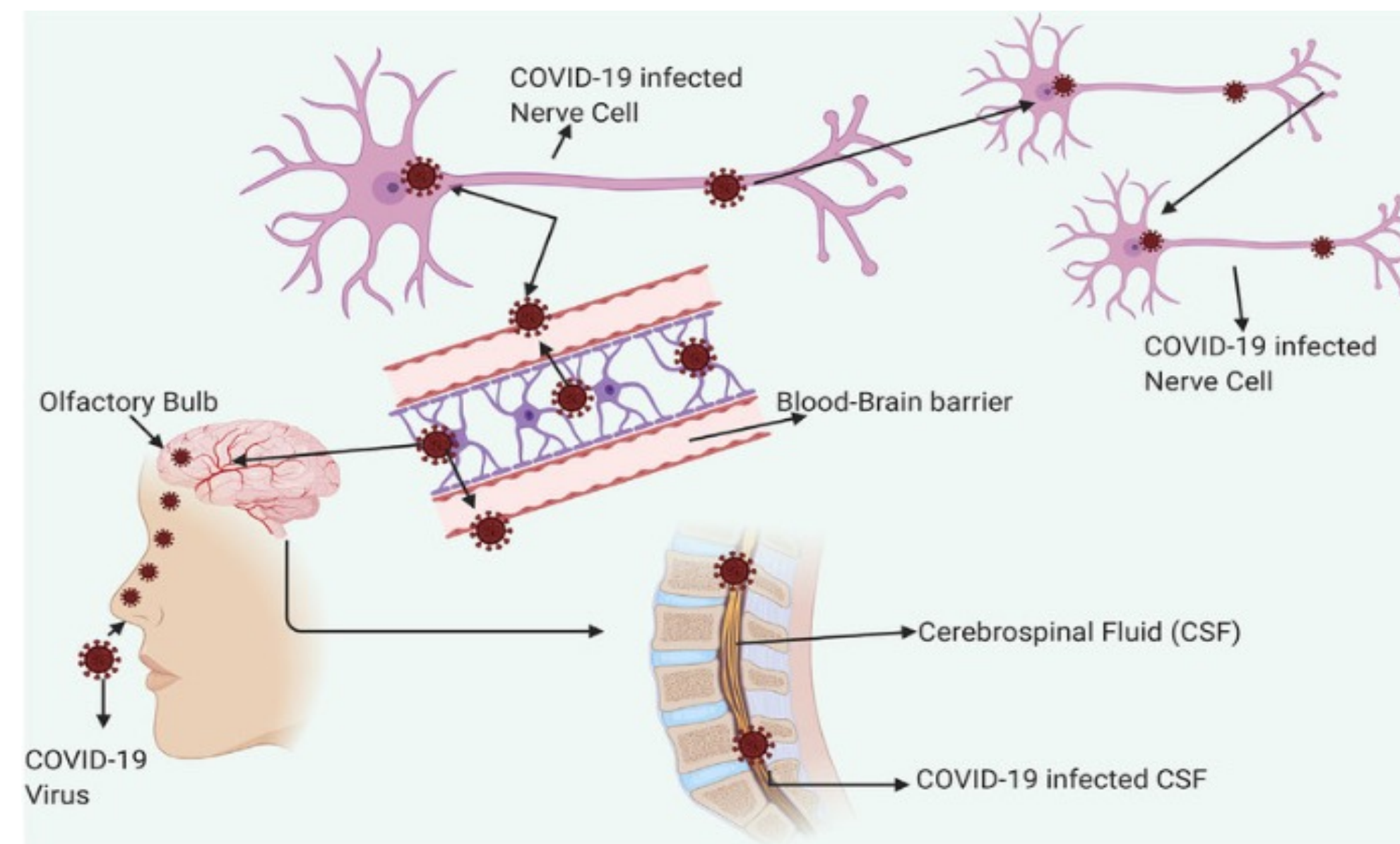
Discussion

- Given the acute onset soon after becoming ill, and lack of evidence of primary psychosis or substance-induced psychosis, our patient's symptoms were felt to be **associated with her COVID-19 diagnosis**.

There are various **proposed mechanisms** for the induction of psychosis with COVID-19:

1. Psychosis is caused by the virus itself invading the CNS

- A postulated point of entry into the CNS is through the olfactory mucosa⁴. SARS-CoV2 enters endothelial cells through angiotensin-converting enzyme 2 receptors⁴.



Vellingiri, B., Jayaramayya, K., Iyer, M., Narayanasamy, A., Govindasamy, V., Giridharan, B., Ganesan, S., Venugopal, A., Venkatesan, D., Ganesan, H., Rajagopalan, K., Rahman, P., Cho, S. G., Kumar, N. S., & Subramaniam, M. D. (2020). COVID-19: A promising cure for the global panic. *The Science of the total environment*, 725, 138277. <https://doi.org/10.1016/j.scitotenv.2020.138277>

- Anosmia, memory lapses, headaches, and ataxia may be an indication of CNS invasion
- Case reports exist in which SARS-CoV-2 has been detected in CSF^{2,5} but there is limited evidence of this

2. Psychosis is caused by a secondary inflammatory process

- Entry into the CNS can lead to a cytokine storm, micro-thromboembolic events, neuronal damage, and resulting neuropsychiatric symptoms¹.
- Commonly associated markers are CRP and ferritin³.
- These patients tend to be hospitalized and have more severe COVID-19 symptoms³.

3. Psychosis is caused by extreme fear of the virus and isolation related to COVID-19

- Typically involves 1-2 positive symptoms such as delusions or paranoia, which are likely to be related thematically to the COVID-19 pandemic^{3,6}.

Discussion (continued)

Delirium?

- Notably, many case reports mention associated disorientation and fluctuating levels of attention, in older patients with exclusively positive symptoms of psychosis (delusions, hallucinations, paranoia), with response to low doses of antipsychotics^{3,6}.
- This raises concern for **misdiagnosis** of the psychotic symptoms of delirium as a psychotic episode.

Our patient

In our patient, the **most likely mechanism** appears to be that the virus itself produced the psychosis, for the following reasons:

- Our patient's memory lapses and anosmia raise concern for CNS invasion by the virus.
- The other mechanisms are less likely because of the lack of evidence of delirium, significant inflammatory process, and excessive fear about the pandemic.

Conclusion

- As COVID-19 and its variants become more prevalent, associated psychosis cases will rise as well.
- A better understanding of the clinical features, etiology, and management guidelines are needed to more successfully diagnose and treat patients.
- Further research is needed to more fully characterize the illness.

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