

# Proposed Management of Post-COVID Condition Brain Fog with Adderall: A Case Report

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## Background Information

### What is Post COVID-19 Condition?

- Definition: symptoms persisting  $\geq 2$  months after acute phase or  $\geq 3$  months after the initial symptoms of COVID present
- Psychological symptoms: cognitive impairment, brain fog, poor memory, depression, anxiety, psychosis, seizures, and suicidal behavior
- 33.6% of patients had persistent neuropsychiatric symptoms  $\geq 6$  months following the acute COVID-19 infection

### Why does this matter?

- Approximately 10% of patients with acute COVID-19 will develop Post COVID-19 Condition
- Estimated 22 million Americans with Post COVID-19 Condition
- Over 3 million people are out of work due to Post COVID-19 Condition
- Financial burden of 200 billion dollars per year

## Patient Case

- 35-year-old white female
- Past psychiatric history: generalized anxiety disorder and alcohol use disorder
- 2-year history of worsening concentration and cognitive processing
- Symptoms started directly after COVID-19 infection
- Tried phentermine for weight loss with primary care physician, which led to full resolution of cognitive symptoms

## Discussion

### How does COVID lead to cognitive side effects?

1. SARS CoV 2 protein induced direct neuroinflammation and hypoxia on cerebral vascular epithelium
2. Increased TNF-alpha results in upregulation of NMDA receptors
3. Cytokine storms lead to decreased production of serotonin.
4. Disruption of dopamine decarboxylase (DCC), an enzyme involved in both dopamine and serotonin synthesis

### What are some of the functional changes observed after COVID-19 infection?

- Hypometabolic changes in olfactory gyrus, amygdala, hippocampus, cingulum, and pons

### How might Adderall treat Post COVID-19 Condition?

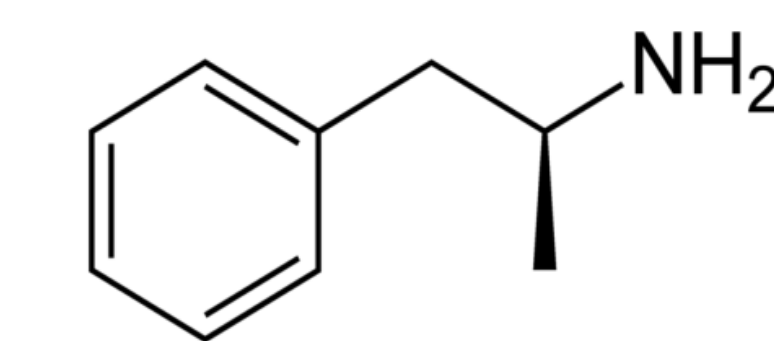
- Adderall primarily targets dopamine active transporter (DAT), norepinephrine transporter (NET), and serotonin transporter (SERT) to block the reuptake of dopamine, norepinephrine, and serotonin
- Thus, Adderall leads to a net increase in dopamine, norepinephrine, and serotonin, all of which are decreased via the molecular imbalances that may persist following COVID-19 infection.
- Increased levels of dopamine, norepinephrine, and serotonin would help to improve the neuropsychiatric symptoms associated with Post COVID-19 Condition.

## Patient Outcomes

- Full symptom relief of cognitive impairment which included changes in memory and concentration
- Resolution of Post COVID-19 Condition
- Continued treatment with Adderall 10mg BID

## Conclusion

- No FDA-approved treatments for Post COVID-19 Condition
- Adderall may be a viable treatment due to its effects on the dopaminergic pathway that is disrupted by the COVID-19 virus.
- Larger sample size required to determine statistical significance of treatment.



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