The impact of COVID-19 on cognition in severe cases highlights the need for comprehensive neuropsychological evaluations in all survivors

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The study by Jaywant et al. [1] in this issue is an early characterization of the potential for longer-term consequences of the COVID-19 pandemic on brain function. This manuscript reports on an observational (cross-sectional) study investigating the relationship between COVID infection/hospitalization and cognitive outcomes in 57 hospitalized participants recovering from COVID-19 in rehabilitation units in New York City. The characteristics of the sample (75% male; 61% non-Caucasian, mean age = 64 years old) are consistent with the profile of greatest vulnerability to developing a severe case of COVID-19. Most patients required intubation for medical ventilation (77%) and suffered from hypoxia (88%) prior to neuropsychological assessment in the rehab setting.

Among this population, the authors report a high prevalence of cognitive impairment (>80% of the sample), primarily in the domains of attention and executive function. Most patients had a mild/borderline impairment (<1 SD below the normative sample data) and there were no significant associations between cognitive performance and psychiatric symptoms, duration of intubation, or time since extubation. As this was a sample of convenience, where data were derived retrospectively from the clinical chart, a thorough characterization of cognition prior to hospitalization was not available. This is a limitation, as results from a recent study conducted in the UK showed that lower cognitive ability was actually a key risk factor associated with the likelihood of COVID-19 infection/hospitalization [2].

The Jaywant study also reported a trend toward worse cognitive outcome in those patients who presented with delirium during their hospitalization. While the effect was only trend-level in this study, these results are consistent with another recently published study that indicated a higher rate of cognitive impairment in COVID-19 patients who experienced delirium relative to COVID-19 patients without delirium [3]. This may be an important clinical predictor of poor outcome.

Consistent with this study, most prior studies on cognitive sequelae associated with COVID-19 have been focused on older adults who were hospitalized with a serious form of the illness. Although this limits the generalizability of the work, an important limitation given the widespread nature of COVID infection worldwide, there is a strong rationale for focusing on this population as one with the greatest vulnerability for cognitive and functional decline. The mechanism by which COVID-19 influences cognitive dysfunction is unknown but is likely multi-factorial. Among the most widely hypothesized factors are the neuroinflammatory responses resultant from a protracted state of systemic inflammation that disrupts the blood-brain-barrier and damages neural and glial cells; other factors may include cerebrovascular ischemia, acute respiratory distress syndrome, direct viral infection of the nervous system (although evidence is sparse), as well as factors related to the treatment and hospitalization for COVID-19 such as drug treatments and invasive ventilation and sedation [4].

As the longer-term effects of this pandemic unfold over time, there will be many additional questions to be addressed. Millions of people have been infected with COVID-19, spanning a broad age range and with highly variable symptom severity. The possible downstream cognitive and psychological effects on younger, mild or asymptomatic, cases have not been investigated and this could have the potential for massive societal impact.

The results presented here, alongside the handful of similar studies conducted across the globe, strongly argue for the need to include comprehensive neuropsychological and psychiatric evaluations in all COVID-19 survivors. Specific prevention and intervention programs that target cognition and other mental health consequences of COVID-19 will be an important next step to reduce individual suffering and disability. The authors declare no competing interests.

AUTHOR CONTRIBUTIONS
KEB drafted the original manuscript; CEM edited and critically reviewed the manuscript.

ADDITIONAL INFORMATION
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