Faculty of Medicine
Baseline Characteristics, Structural Brain Differences, and Cognitive Performance between Patients with Long-COVID and those with Normal Recovery
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Background
Participants were recruited from hospitals and ICUs

Compare long-COVID and normal recovery on:

• No neuroimaging studies have compared long-COVID to a normal course of recovery from COVID-19.
• Inconsistent diffusion imaging (DTI) findings in long-COVID compared to normal recovery.
• No group differences in age-related factors between long-COVID (LC) and normal recovery (NR).

Objectives

Compare long-COVID and normal recovery on:

i) White matter microstructure of the brain
ii) Objective cognitive performance

Methods

6-months post-acute COVID-19

• Participants were recruited from hospitals and ICUs (n=25) or the community (n=66).
• Long-COVID (n=56) and normal recovery (n=35) group comparison on DTI metrics using tract-based spatial statistics with 2000 permutations, covarying for age and sex.
• Cognitive analyses compared age-adjusted fluid composite score, covarying for crystallized composite score and education.

Results

Sample Characteristics:

• Long-COVID (LC) had a higher number of neurologic symptoms during acute illness than normal recovery (NR).
• Common long-COVID symptoms include fatigue, cognitive and memory problems, and body aches.

DTI Results: LC had significantly lower mean diffusivity (MD) than the NR group in widespread white matter regions (Figure 1). Significant white matter tracts included the corpus callosum, corona radiata, internal capsule, external capsule, and posterior thalamic radiation. There were no significant differences between groups for fractional anisotropy or radial diffusivity.

Conclusions

• The long-COVID group showed diffusion imaging differences that may suggest persistent gliosis or edema.
• Despite the prevalence of neuropsychiatric long-COVID symptoms, there was no difference in objective cognitive performance, between long-COVID and normal recovery.
• The lack of cognitive performance differences may indicate symptom-specific or domain-specific deficits.
• Future studies will focus on whether specific symptoms are differentially associated with structural neuroimaging metrics and cognitive performance.

References


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