

Exercise Intolerance in Patients with Long COVID Neurological Sequelae: Retrospective Cohort Study

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Background

Long Covid, as defined by COVID-19 symptoms greater than 1 month include a wide variety of symptoms over multiple organ systems. Fatigue (both mental and physical) is the most common reported symptom (1,2) with many endorsing exercise intolerance (EI) specifically.

Purpose

The purpose of this study is to identify incidence of EI and underlying etiologies in patients with persistent neurological sequelae from COVID-19 infection (Long Covid).

Methods

- Ten patients ages 18-66 (avg 41) underwent 36 total visits completing monitored exertional testing
- Follow-up visits (avg 4.2)
- EI defined by: 3pt symptom increase during exertion and/or signs/symptoms of dysautonomia on post exertion orthostatics.
- Pre/post exercise force plate (FP) sway velocities & King Devick (KD) were also completed to assess possible vestibuloocular etiologies of EI.



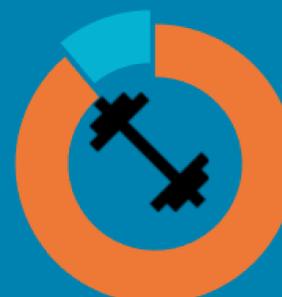
Image 1: Monitored Exertional Testing



Results

- Exercise intolerance exhibited in 9 of 10 patients (90%).
 - 28 of 32 visits (87.5%) overall.
- Average presenting exertional tolerance threshold was mild-moderate range (120-130bpm).
- Dysautonomia was the main etiology of exercise intolerance.
 - Was exhibited by 8 of 9 patients with EI
 - 18/28 exertional trails (65.28%) with 40.28% exhibiting OH or POTS.
 - 7/28 (25%) reporting significant clinical symptoms of dysautonomia on orthostatic testing (2-point worsening of dizziness or lightheadedness upon standing).
- Pre and post exercise balance exhibited 3/28 (10.71%) with significant worsening on sway velocity.
- Pre and post exercise visual testing exhibited only 1/28 (3.57%) with significant visual worsening on KD testing.
- Trends showed gradually improving exercise tolerance over serial testing.
- Average threshold increased to 130-140bpm at final study visit.

10%
 Patients without Exercise Intolerance



90%
 Patients with Exercise Intolerance

Figure 1: Rate of Exercise Intolerance

Conclusions

- Exercise intolerance is commonly endorsed in patients with Long COVID and was exhibited on formal exertional testing in the majority of patients.
- The most common cause appeared to be related to impaired autonomic dysfunction.
- Symptom exacerbation also appeared to contribute significantly to EI in Long COVID.

Significance

Exercise intolerance is a common cause of morbidity in Long COVID and exertional testing can help identify it, its potential underlying causes, and guide sub-threshold exertional therapy.

Etiologies of Exercise Intolerance

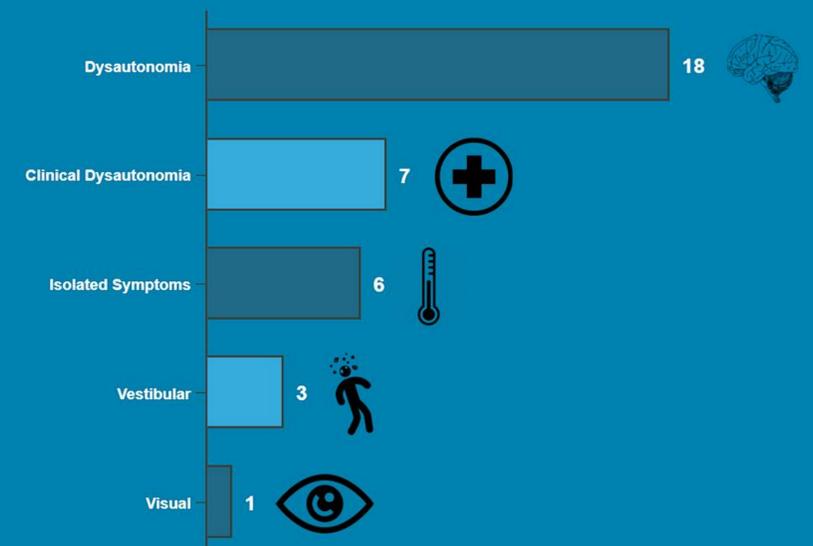


Figure 2: Etiologies of Exercise Intolerance