

In brief

Exercise and long COVID

15 July 2022

Question(s)

- Is exercise helpful in individuals with long COVID?
- Is post-exertional symptom exacerbation a risk in long COVID?

Summary

- Studies evaluating pulmonary rehabilitation and exercise programs show that exercise is beneficial to improving functional outcomes such as movement, muscle strength and quality of life in people with long COVID.^{1,2} They do not typically mention post-exertional symptom exacerbation as a complication in their participants.
- There is a need for high quality research into long COVID rehabilitation, including the role of exercise, particularly in the context of the Omicron variant.
- Available clinical guidelines recommend a gradual increase in exercise based on symptoms and on an individual basis.³⁻⁶
- Some people with long COVID appear to be at risk of post-exertional fatigue or malaise. There is little research on this to date.
 - Researchers have noted that post-exertional symptom exacerbation in long COVID is similar to the fatigue observed in other post-viral conditions.^{7,8}
 - A study based on self-reported symptoms reported that post-exertional symptom exacerbation occurred in nearly half (46.9%) of participants with self-reported long COVID, based on symptom criteria designed for the study. Of the participants with long COVID, 58.7% met the scoring thresholds used to identify post-exertional symptom exacerbation in people with chronic fatigue / myalgic encephalomyelitis.⁷
 - No other studies were identified on the risk of developing post-exertional symptom exacerbation after COVID-19 infection.
- Overall, evidence is weak⁹ with inadequate research designs, inconsistent definition of long COVID, and changing context in terms of variants and vaccination. A meta-analysis (pre-print) noted that studies can be overrepresented by patients with greater severity of acute COVID-19, comorbidities or lower baseline fitness.¹⁰

Background

Exercise (often within the context of a more comprehensive pulmonary rehabilitation program) is commonly prescribed for recovery after intensive care stays¹¹ and for management of chronic respiratory conditions.¹² It is unclear if exercise is helpful for people with long COVID, or if it may be associated with post-exertional symptom exacerbation, as occurs in chronic fatigue / myalgic encephalomyelitis.¹³

Synthesised literature

Peer-reviewed literature

- In a randomised control trial for individuals with ongoing dyspnoea after COVID-19, exercise in the context of a pulmonary rehabilitation group was shown to improve: ability to walk six metres, lower limb muscle strength physical health-related quality of life. The study had transparent reporting around adverse events and dropout rates and demonstrated no concerns associated with post-exertional fatigue.¹
- In a conference abstract (not yet available as an article), exercise in the context of a pulmonary rehabilitation group was also associated with decreases in fatigue compared to a control group for post-acute COVID-19 patients (not specifically those with long COVID).¹⁴
- Remaining studies discuss results associated with exercise in COVID-19 patients, however, often do not:
 - directly measure fatigue as an outcome
 - mention post-exertional fatigue or malaise, dropout rate or adverse events
 - have a control (and act instead as pilot studies and commentaries on feasibility¹⁵⁻¹⁷)
 - pertain specifically to long COVID but only to post-acute COVID exercise.¹⁸
- A narrative review discusses that in the absence of high-quality evidence on post-exertional symptoms in long COVID, the principles established for the management of post-exertional symptoms in chronic fatigue syndrome / myalgic encephalomyelitis could instead be adopted.⁸ The review highlights that in those better-studies populations, understanding triggers, onset latency, and the time course of post-exertional fatigue can help clinicians to construct rehabilitative programs that avoid worsening symptoms.

Grey literature

- There are several clinical management guidelines for patients with COVID-19 and long COVID. In the absence of high-quality evidence, such guidelines are predominantly developed based on clinical expertise, consensus approaches and by reiterating recommendations from other similar populations or situations, e.g. previous outbreaks of viral pneumonias, post ICU recovery principles and chronic fatigue.
- The [World Health Organization](#) has suggested (November 2021) that a gradual increase in exercise should be based on symptoms, and that the training principles of comprehensive pulmonary rehabilitation programmes apply for COVID-19 patients with persistent fatigue, reduced exercise capacity and breathlessness.⁴
- The [Canadian Thoracic Society](#) has suggested (November 2021) beginning at lower intensities for aerobic exercise, conservative progression, monitoring of symptoms to prevent post-exertional malaise, and gradual introduction of strengthening exercises and modifying education modules to consider the specific challenges related to COVID-19.³
- The [Centres for Disease Prevention and Control](#) has suggested (June 2021) that a gradual return to exercise as tolerated could be helpful for most patients. It also suggested that a conservative physical rehabilitation plan might be indicated for some patients (e.g., people with post-exertional malaise) as well as consultation with physiatry for cautious initiation of exercise and that recommendations about pacing may be useful.⁵

- The [British Thoracic Society](#) (September 2020) highlighted the lack of evidence for the specific topic and suggested that the principles of exercise prescription remain as described for non-COVID individuals who have significant deconditioning and breathlessness. Survivors of COVID-19 who report fatigue may benefit from an exercise programme prescribed using the principles of graded exercise therapy. Support may be required from experts in the management of chronic fatigue syndrome / post viral fatigue syndrome.⁶
- The [Stanford Hall](#) consensus statement (May 2020), designed for very active individuals (e.g. military personnel or athletes), suggested that:¹⁹
 - Low intensity exercise should be considered initially, particularly for patients who required oxygen therapy, while concurrently monitoring vital signs. Gradual increase in exercise should be based on symptoms.
 - With very mild symptoms, which may or may not be due to COVID-19, consider limiting activity to light activity but limit sedentary periods. Increase rest periods if symptoms deteriorate. Prolonged exhaustive or high-intensity training should be avoided.
 - On return from mild/moderate COVID-19 illness to exercise, one1 week of low-level stretching and light muscle strengthening activity should be trialled prior to targeted cardiovascular sessions.
- Most of these guidelines include additional caveats for individuals affected by myocarditis, blood clots, including pulmonary embolism, or other complications.

Method

To inform this brief, PubMed and Google searches were conducted using terms related to long COVID, exercise and pulmonary rehabilitation on 16 June 2022.

References

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