The effects of a low-intensity mixed training program on physical capacity in long Covid patients

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INTRODUCTION

According to the World Health Organization[1], long COVID (LC) would be present in 10-20% of COVID-19 cases. The most frequent symptoms of long COVID are fatigue, dyspnea, olfactory dysfunction, myalgia, and cough[2]. Post-exertion malaise was also observed in LC cases and can have an adverse impact on the daily living of patients[3],which in turn influences physical activity and capacity. Exercise is also known to be an effective way to increase physical function in chronic fatigue syndrome[4]. Benefits of exercise could potentially be an asset for patients to recover from LC.

OBJECTIVE

The aim of this study was to assess the impact of a closely monitored 8-week mixed exercise program (3x/week) on physical capacity, symptoms and fatigue in LC participants.

METHODS

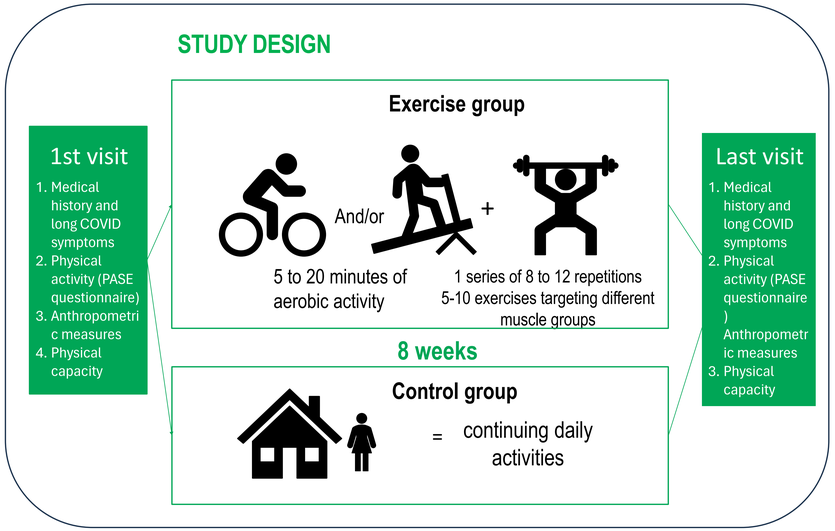
Twenty-five women and men (Biobanque Québécoise de la COVID-19) were split in the exercise and control groups. Physical capacity, physical activity level and the presence of common LC symptoms were measured before and after the intervention. Fatigue was measured before each training session as a surrogate of post-exertion malaise (of the previous session).

POPULATION

	Control (n=10) 2 men, 8 women		Exercise (n=15) 7 men, 8 women		Significance
	Pre	Post	Pre	Post	
Age (yrs)	51.8 ± 16.7	-	51.3 ± 12.2	-	
Weight (kg)	72.8 ± 9.3	73.31 ± 9.99	81.2 ± 10.2	80.85 ± 9.88	*p=0.060* [b]
Height (cm)	164.1 ± 6.1	-	167.3 ± 7.3	-	
BMI (kg/m^2)	27.2 ± 4.3	27.65 ± 4.53	29.1 ± 4.3	28.96 ± 4.01	*p=0,077* [c]
Waist circumference (cm)	92.8 ± 11.5	92.50 ± 11.82	101.7 ± 8.7	101.11 ± 7.55	p=0.036 [b]
Systolic Blood pressure (mmHg)	119.6 ± 11.9	118.00 ± 12.19	122.7 ± 12.6	122.73 ± 11.44	n.s.
Diastolic blood pressure (mmHg)	78.2 ± 7.6	76.30 ± 6.83	77.3 ± 7.6	79.13 ± 6.41	n.s.
Resting heart rate (BPM)	82.1 ± 9.8	75.80 ± 1.00	77.1 ± 10.3	74.73 ± 10.81	*p=0,057* [c]

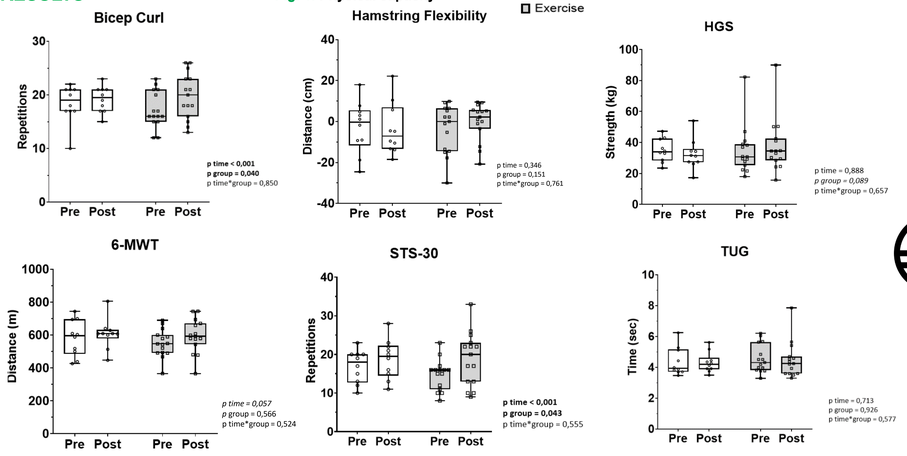
p values in Italic indicate tendencies;
[a] effect of time ;
[b] effect of group ;
[c] time X group interaction effect

STUDY DESIGN



RESULTS

Fig. 1. Physical capacity



No significant impact was observed for the different symptoms : altered taste and smell, anxiety, neurological symptoms, general pain, asthma, resting shortness of breath and shortness of breath on exertion.

Fig. 2. Pre-training fatigue average

Table 1. Physical activity level : PASE questionnaire results

	Pre	Post	Sig.
Control group	229.20 ± 91.82	202.80 ± 87.05	p=0.007
Exercise group	181.90 ± 82.53	234.47 ± 90.47	

DISCUSSION

Physical capacity : Our results show that the program improved physical capacity in exercise LC patients. The program might have had a greater effect on muscular strength than cardiovascular endurance. This significant result is likely explained by an increased capacity of the former since the exercise program included exercises that specifically targeted the lower limbs.

Physical activity level : The greater increase in physical activity level in the exercise group indicates a positive effect of the program on their daily functioning. The control group score also improved, although less dramatically, which indicates that physical capacity improves over time after long COVID.

Symptoms and fatigue : Although our results show no improvement in symptoms in the exercise group, it is noteworthy that the questionnaire we used did not measure the severity of symptoms. It is possible that although still present, the severity has decreased such as suggested by our direct observation. Additionally, it is worth mentioning that physical exercise did not worsen general fatigue.

CONCLUSION

Supervised and adapted exercise is safe and effective to accelerate recovery of physical capacity in LC patients without inducing post-exertion malaise. Our results support the relevance of closely monitored exercise prescription in LC to accelerate recovery of functional decline.

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