

**11307****Cardiopulmonary exercise testing in post-COVID-19 patients: Where does exercise intolerance come from?**

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**Background:** Post-COVID-19 persistent symptoms and exercise intolerance are poorly understood. Cardiopulmonary exercise testing (CPET) assessment is important to address the sources of the underlying symptoms and limitations.

**Purpose:** To evaluate the source and magnitude of exercise intolerance in post-COVID-19 subjects via CPET.

**Methods:** This cohort study assessed subjects with different SARS-CoV-2 illness severities. The propensity score matching method was used to select the control group. Patients with available CPET prior to SARS-CoV-2 infection were compared before and after COVID-19.

**Results:** 288 subjects (144 post-COVID-19 and 144 matched-controls) were assessed. The median age was 43.0 years, and 57% were male, with different illness severity (60.4% mild, 20.8% moderate, 18.8% severe). Residual symptoms were reported in 41% of the sample. CPET was performed 14.4±9.4 weeks after disease onset, with exercise limitations being attributed to the peripheral muscle (91.7%), pulmonary (6.3%), and cardiovascular (2.1%) systems. Lower median percent-predicted peak oxygen consumption was observed in the severe subgroup (72.2%) compared to both mild (98.5%) and control subgroups (91.6%). Peak oxygen consumption (peakVO<sub>2</sub>), VO<sub>2</sub> at the ventilatory thresholds (VO<sub>2</sub> at VT), and heart rate differed among illnesses, severities, and controls. Conversely, ventilatory equivalents, oxygen uptake efficiency slope, and peak oxygen pulse were similar (Figure 1). Additional subgroup analysis of 42 subjects with prior CPET revealed changes only on peak treadmill speed in the mild subgroup and additional reductions on peakVO<sub>2</sub> and VO<sub>2</sub> at VT in the moderate/severe subgroup (Figure 2), while ventilatory equivalents, oxygen uptake efficiency slope, and peak oxygen pulse remained unchanged.

**Conclusions:** Peripheral muscle fatigue was the most common etiology of exercise limitation in post-COVID-19 patients regardless of the SARS-CoV-2 illness severity. Our data suggest that treatment should emphasize comprehensive rehabilitation programs, including aerobic and muscle strengthening components.

34.1.1 - Spiroergometry

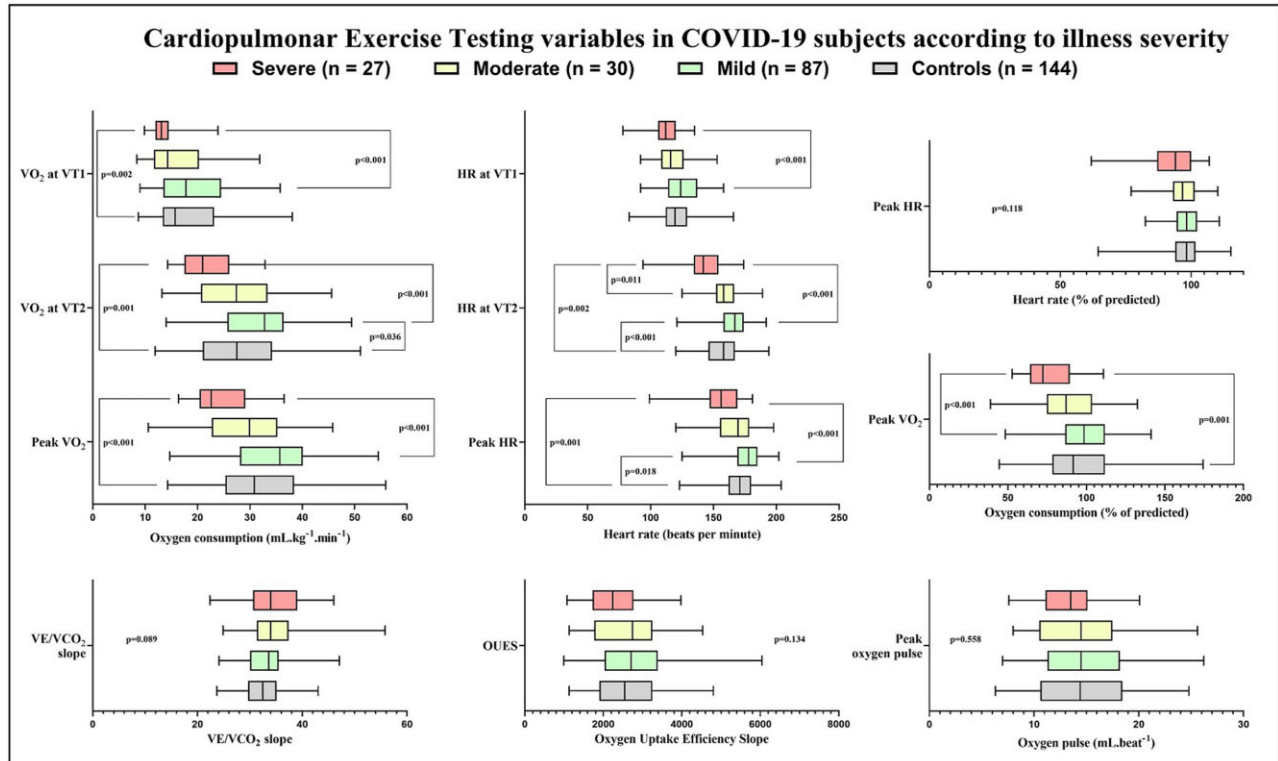


Figure 1

**Differences on Cardiopulmonary Exercise Testing variables (After minus Before COVID-19)**

COVID-19 severity ■ Mild (n = 27) ■ Moderate/Severe (n = 15)

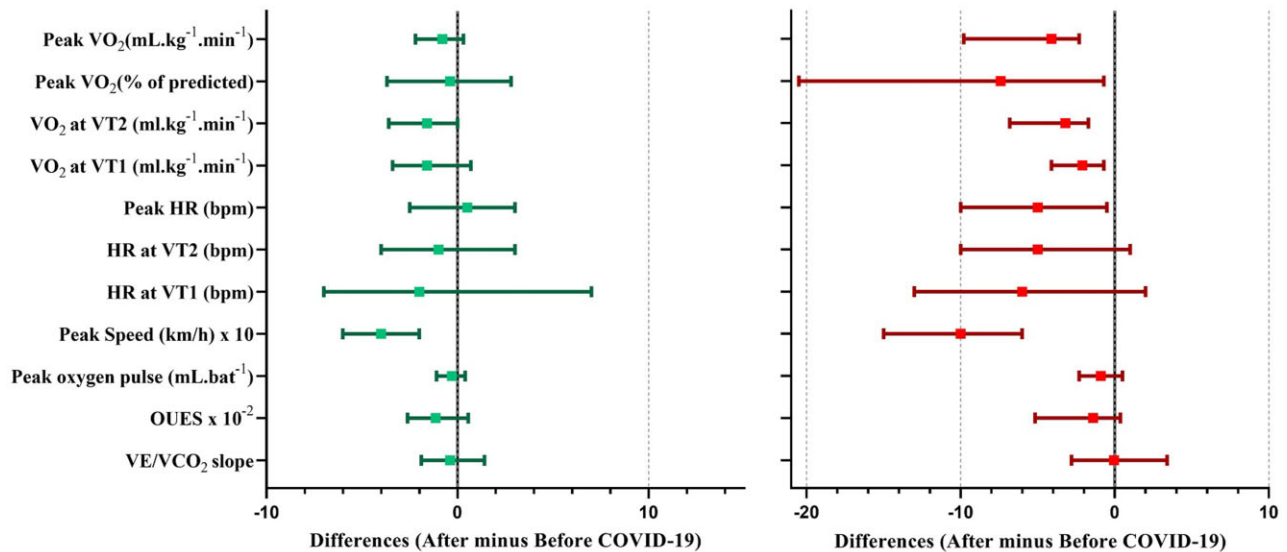


Figure 2