Outcomes

COVID-19 era in long-term cardiac rehabilitation programs: how was muscle strenght and lean mass affected in cardiovascular patients?

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Introduction: Exercise prescription is one of the main components of phase III Cardiac Rehabilitation (CR) programs due to its documented prognostic benefits. It has been well established that, when added to aerobic training, resistance training (RT) leads to greater improvements in peripheral muscle strength and muscle mass in patients with cardiovascular disease (CVD). With COVID-19, most centre-based CR programs had to be suspended and CR patients had to readjust their RT program to a home-based model where weight training was more difficult to perform. How COVID-19 Era impacted lean mass and muscle strength in trained CVD patients who were attending long-term CR programs has yet to be discussed.

Purpose: To assess upper and lower limb muscle strength and lean mass in CVD patients who had their centre-based CR program suspended due to COVID-19 and compare it with previous assessments.

Methods: 87 CVD patients (mean age 62.9 ± 9.1, 82.8% male), before COVID-19, were attending a phase III centre-based CR program 3x/week and were evaluated annually. After 7 months of suspension, 57.5% (n = 50) patients returned to the face-to-face CR program. Despite all constraints caused by COVID-19, body composition and muscle strength of 35 participants (mean age 64.7 ± 7.9, 88.6% male) were assessed. We compared this assessment with previous years and established three assessment time points: M1) one year before COVID-19 (2018); M2) last assessment before COVID-19 (2019); M3) the assessment 7 months after CR program suspension (last trimester of 2020). Upper limbs strength was measured using a JAMAR dynamometer, 30 second chair stand test (number of repetitions – reps) was used to measure lower limbs strength and dual energy x-ray absorptiometry was used to measure upper and lower limbs lean mass. Repeated measures ANOVA were used.

Results: Intention to treat analysis showed that upper and lower limbs lean mass did not change from M1 to M2 but decreased significantly from M2 to M3 (arms lean mass in M2: 5.68 ± 1.00kg vs M3: 5.52 ± 1.06kg, p = 0.004; legs lean mass in M2: 17.40 ± 2.46kg vs M3: 16.77 ± 2.61kg, p = 0.040). Lower limb strength also decreased significantly from M2 to M3 (M2: 23.31 ± 5.76 reps vs M3: 21.11 ± 5.31 reps, p = 0.014) after remaining stable in the year prior to COVID-19. Upper limb strength improved significantly from M1 to M2 (M1: 39.00 ± 8.64kg vs M2: 40.53 ± 8.77kg, p = 0.034) but did not change significantly from M2 to M3 (M2 vs M3: 41.29 ± 9.13kg, p = 0.517).

Conclusion: After CR centre-based suspension due to COVID-19, we observed a decrease in upper and lower limbs lean mass and lower limb strength in previously trained CVD patients. These results should emphasize the need to promote all efforts to maintain physical activity and RT through alternative effective home-based CR programs when face-to-face models are not available or possible to be implemented.