

Remotely monitored cardiac rehabilitation based on a walking test during the COVID-19 pandemic

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Background: Since the beginning of 2020, the SARS-CoV-2 pandemic, causing COVID-19, has been affected worldwide. During the first and second waves of the COVID-19 pandemic, health care provision was significantly reduced or interrupted as a precaution. In particular quarantine and social isolation, public health preventive measures of the SARS-CoV-2 pandemic have been found to be associated with worsening cardiovascular risk factors. CR exercise programs have also been affected by these restrictions" effects, and stress testing was attenuated due to concerns about the spread of the disease through the potential transfer of aerosol particles. Therefore, in many centers or specialized clinics, CR programs have been partially interrupted.

Purpose: The purpose of our research was to propose the possibility of an alternative approach, namely remotely monitored CR, which takes into account the recommendations for COVID-19 quarantine in cardiac patients. We assumed that through the remotely monitored CR based on a walking test, we would conduct an effective alternative intervention to improve cardiorespiratory fitness.

Methods: From October to December 2020, we performed an 8-week study of remotely monitored CR in cardiac patients with low to moderate cardiovascular risk. The intervention was based on the principles of II. phase of CR and consisted of regular physical exercise and teleconsultations in the home-based setting. Patients were instructed to perform regular physical exercise 3 - 5 times a week, for a minimum of 30 minutes, to control the intensity on an HR monitor at the target zone determined by calculation based on the 200-meter fast-walk test (200MFWT) result. Besides, patients were instructed that the physical exercise intensity was consistent with the rate of perceived exertion rating between "somewhat hard" to "hard" (12 - 14). The study physiotherapist was a remote trainer who telemonitored patients and gave them telephone feedback once every two weeks.

Results: The study completed ten patients. All patients were post-cardiac revascularization with recommended medication, including beta-blockers. The average age was 60.5 ± 8.8 years. The statistical analysis showed significantly improved cardiorespiratory fitness by reducing the 200MFWT time from 116.8 ± 7.2 seconds to 105.0 ± 5.8 seconds ($p = 0.005$). The above performance improvement was achieved without a statistically significant change in HRmax at the end of 200MFW. No physical activity-related adverse events were reported throughout the intervention.

Conclusion(s): Our study supports the effectiveness of remotely monitored CR, which can address limited access during the COVID-19 pandemic. Research evidence suggests that CR based on a walking test and telemonitoring via an HR monitor can effectively increase cardiorespiratory fitness in cardiac patients with low to moderate cardiovascular risk.