Impact of COVID-19 Pandemic on Physical Activity in Patients With Implantable Cardioverter-Defibrillators

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Purpose: The coronavirus disease-2019 (COVID-19) pandemic has been spreading rapidly worldwide since late January 2020. The strict lockdown strategy prompted by the Italian government to hamper severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) spreading, has reduced the possibility of performing either outdoor or gym physical activity (PA). This study investigated and quantified the reduction of PA in patients with automatic implantable cardioverter-defibrillators (ICDs) for primary prevention of sudden death.

Methods: Daily PA of 24 patients was estimated by processing recorded data from ICD-embedded accelerometric sensors used by the rate-responsive pacing systems.

Results: During the forced 40-d in-home confinement, a mean 25% reduction of PA was observed as compared with the 40-d confinement-free period (1.2 ± 0.3 vs 1.6 ± 0.3 hr/d, respectively, \( P = .0001 \)).

Conclusions: This objective quantification of the impact of the COVID-19 pandemic on PA determined by an ICD device showed an abrupt and statistically significant reduction of PA in primary prevention ICD patients, during the in-home confinement quarantine. To counteract the deleterious effects of physical inactivity during the COVID-19 outbreak, patients should be encouraged to perform indoor exercise-based personalized rehabilitative programs.

Key Words: cardioverter-defibrillators • COVID-19 • physical activity

METHODS

We analyzed data of 24 patients (72 ± 10 yr, 17 males) implanted with ICDs (Boston Scientific) for primary prevention of sudden death and with home-monitoring follow-up. Such ICDs enable a continuous monitoring and recording of PA via embedded accelerometric sensors used by the rate-responsive pacing systems. Recorded data were then processed by a specific algorithm and translated into estimates of time spent in movement, that has been used as surrogate of PA.

RESULTS

During the forced 40-d in-home confinement, a 25% mean reduction of PA was observed as compared to the 40-d confinement-free period (mean 1.6 ± 0.5 vs 1.2 ± 0.3 hr/d, respectively, \( P = .0001 \)). Since left ventricular systolic dysfunction is not uncommon in primary prevention ICD patients, baseline exercise performance is expected to be low and this may account for the relatively shallow decline in PA of our patients. Thus, data were reanalyzed after excluding very inactive patients (ie, PA <1 hr/d), but results did not change showing a significant decrease in PA after lockdown began (2.0 ± 0.6 vs 1.5 ± 0.4 hr/d, respectively, \( P = .0001 \)).
DISCUSSION
This may be the first objective quantification of the impact of the COVID-19 pandemic on PA determined by an ICD device. An abrupt cessation of physical exercise has been associated with rapid loss of PA-related benefits. A mild reduction by even 25% of daily PA in poorly trained ICD patients may underlie a clinically significant worsening of frailty (eg, increasing fall risk) and loss of metabolic, cardiovascular, and musculoskeletal conditioning within just two weeks. To counteract the deleterious effects of physical inactivity during the COVID-19 outbreak, patients should be encouraged to perform indoor exercise-based personalized rehabilitative programs.

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