

HFrEF patient activity levels during COVID-19 lockdown: A comparison between physical activity questionnaires and implantable devices data

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Background: The ongoing COVID-19 pandemic is a major public health crisis of great risk to patients with cardiovascular comorbidities. Heart failure (HF) is a deadly chronic disease, a leading cause of hospitalizations worldwide and a great detriment to patients' quality of life. HF therapy guidelines suggest prescribing physical activity to improve long-term outcomes. Self- or government- imposed behavioral modifications in response to COVID-19 ranging from avoiding social interactions to outright restrictions of movement (lockdowns) could compromise regular PA in HF patients, who constitute an extremely high-risk group.

Purpose: Investigate the effect of the national lockdown in Greece 23rd March – 4th May 2020) on the PA levels of patients suffering from HF with reduced ejection fraction (HFrEF) and cardiac implantable electronic devices (CIEDs).

Methods: HFrEF patients with CIEDs were included in the study. Participants answered the Physical Activity Questionnaire (PAQ) regarding the period before, during and after the 42-day national lockdown. CIED-derived daily activity levels for the corresponding periods were recorded through CIED telemetry. The differences in PAQ- and CIED-derived PA levels and sedentary time before, during and after the lockdown period were investigated.

Results: 67 HFrEF patients participated in the study (mean age $69 \pm 10.2y$, 85% male). Activity levels fell in 55 (82%) of patients. The median PAQ-derived PA level decreased by 28% during lockdown, from 840.5 (944) METmin/week to 602 (1054) METmin/week during the lockdown ($p = 0.01$). A 53% increase was observed after the lockdown, to 924 (1214) METmin/week ($p = 0.004$). The CIED-derived activity level was 2.38 (1.3) hours/day pre-lockdown, 1.78 (1.1) hours/day during the lockdown (25% decrease, $p < 0.001$) and 2.69 (1.5) hours/day post-lockdown (51% increase, $p < 0.001$). Time spent on sedentary activities also increased to 9 (3) hours per day during the lockdown, up from 6.5 (4) hours before lockdown ($p = 0.001$).

Conclusions: All measures examined in this study indicate that the COVID-19 lockdown period was associated with a significant decrease in HFrEF patients' PA. All efforts must be made on the part of clinicians and public health organizations to promote safe exercise in this subgroup of the population that is particularly vulnerable to the effects of a sedentary lifestyle.

Abstract Figure. Patient activity around COVID lockdown

