

Effects of lockdown on physical activity and arrhythmia burden in patients with an implantable cardioverter-defibrillator: the COVID-19 Lockdown ICD-Carelink (CLIC) study

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Background: Both COVID-19 and the measures taken to control the pandemic may significantly affect cardiovascular health. The effects of a lockdown on physical activity and its potential consequences for arrhythmia burden remain largely unknown.

Purpose: In this study, we investigated the effect of the lockdown during the first COVID-19 wave on patients' physical activity and arrhythmia burden.

Methods: All patients with an ICD connected to a Carelink home-monitoring system from two Dutch hospitals were included. Anonymized data on physical activity, heart rate, and occurrence of ventricular tachycardia/fibrillation (VT/VF), and atrial fibrillation/tachycardia (AF/AT) were obtained and were compared between March-April 2020 (lockdown) and March-April 2019 (reference) within each patient. The study was approved by the local ethics committee.

Results: The ICDs of 531 patients registered significantly less activity during the lockdown period compared to the reference period (210±104 min vs 182±103 min, $p < 0.0001$, Figure 1, panels A and B), while weather conditions improved (1A). Daytime and nighttime heart rates were significantly lower during lockdown compared to the reference period (71.3±9 bpm vs 72.6±9 bpm, $p < 0.0001$ and 63.4±9 vs 63.8±9, $p = 0.02$, respectively). AF/AT burden increased (Figure 2A) while number of VT/VF episodes decreased (2B). There was no significant difference in number of NSVT episodes.

Conclusion: During the lockdown in the first COVID-19 wave, the Carelink system revealed significantly less activity, increase in AF/AT burden and decrease in VT/VF episodes. Further investigation is needed to understand the relationship between physical activity and the occurrence of arrhythmias in ICD patients.

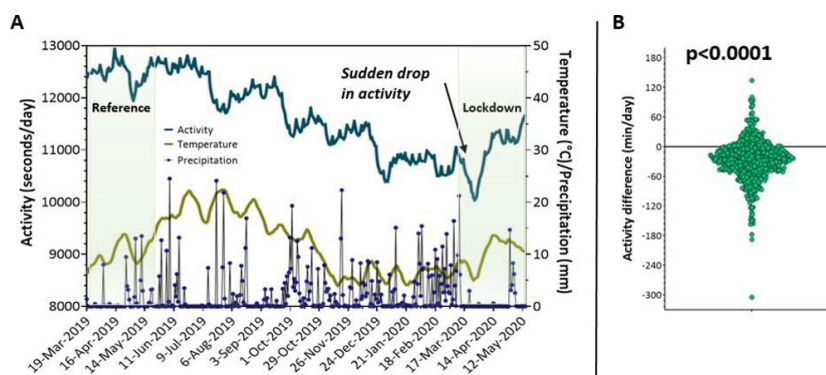


Figure 1. Activity decreased during lockdown

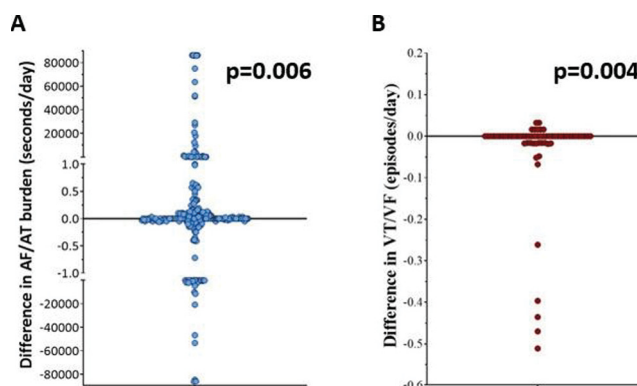


Figure 2. AF/AT increased while VT/VF decreased