

# Cardiac defibrillator therapies during the COVID-19 pandemic: how you look provides perspective

Catherine J. O'Shea <sup>1,2</sup>, Melissa E. Middeldorp <sup>1,2</sup>, Kevin Campbell<sup>1</sup>, and Prashanthan Sanders <sup>1,2\*</sup>

<sup>1</sup>Centre for Heart Rhythm Disorders, University of Adelaide, Adelaide, Australia; <sup>2</sup>Department of Cardiology, Royal Adelaide Hospital, Adelaide, Australia

**This commentary refers to the article 'Ventricular arrhythmia burden during the coronavirus disease 2019 (COVID-19) pandemic', by C.J. O'Shea et al., 2021;42:520–528, doi:10.1093/eurheartj/ehaa893 and the discussion piece 'An attempt to reconcile the contrasting results of analyses on implantable cardioverter-defibrillator shocks during the pandemic', by S. Adabag et al., doi:10.1093/eurheartj/ehab378.**

We thank Drs Adabag and colleagues for their commentary on our analysis of ventricular arrhythmias in implantable cardioverter-defibrillator patients during the first 100 days of the COVID-19 pandemic in the USA.

Our findings of a decline in ventricular arrhythmias requiring defibrillator therapy [anti-tachycardia pacing (ATP) or shock] in an all-comer ICD population, from 20 centres in 13 states, undergoing remote monitoring in the early days of the pandemic, suggested a potential 'pandemic behaviour effect' on ventricular arrhythmias as patients adjusted their lifestyles in response to the pandemic.<sup>1</sup>

In contrast, the authors describe an ICD population living in COVID-prevalent areas, with an increase in ICD shocks demonstrated throughout the pandemic, over a time period that is not clear. We agree that the two study populations are not broadly comparable, with much of our cohort residing in states that, while subjected to restrictions including formal 'stay-at-home' orders, experienced low COVID prevalence during the study period. That said, in states with comparatively higher COVID prevalence, we saw fewer patients experiencing ventricular arrhythmias. It is important to note, however, that our study window occurred prior to the huge surge in US cases seen in July and August 2020.<sup>2</sup>

The discordance between the two studies may be explained by an initial reduction in stress-related arrhythmias as stay-at-home orders were imposed in the early pandemic, with a subsequent rise in COVID infection-related ventricular arrhythmias as the pandemic progressed with growing infection rates. Interestingly though, a recent study assessing ICD therapies during the early pandemic in an Italian region with one of the 'highest rate(s) of infection and death for COVID-19', did not detect a rise in ATP or shocks.<sup>3</sup> This effect may be the culmination of the combined effects of stay-at-home restrictions and high infection rates.

Though our patient cohort experienced relatively high ICD therapy rates overall, this perhaps reflects the real-world nature of the population, with real-world device programming. The crux of the study is not the incidence of ventricular arrhythmias during one time period, but rather the relative dramatic, and progressive, regression in ICD therapies as states responded to the early pandemic.

While cause-and-effect may be difficult to establish in large cohort studies utilizing remote monitoring technology in the absence of individual patient clinical information, such large studies are able to highlight patterns that might otherwise remain unseen in smaller cohorts. Our analysis raises valuable questions about the connection between lifestyle and arrhythmia in our ICD patients.

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\* Corresponding author. Tel: +61883139000, Fax: +61883622273, Email: [prash.sanders@adelaide.edu.au](mailto:prash.sanders@adelaide.edu.au)

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