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Letters to the Editor

Cancer and Cancer Therapy and Their Association With Ventricular Arrhythmia

To the Editor:

We read with interest the review article by Drs Moudgil and Yeh exploring the various molecular mechanisms through which cancer therapy can lead to cardiac toxicities.[1] Specifically, we were interested in the relationship between arrhythmias and cancer chemotherapeutic agents.

We recently published a retrospective study looking at rates of ventricular arrhythmia (ventricular tachycardia [VT] or ventricular fibrillation [VF]) in patients with implantable cardioverter defibrillators (ICDs) and a diagnosis of cancer.[2] We found that in patients who were diagnosed with cancer after ICD implantation, the frequency of ventricular arrhythmias (VT and VF) significantly increased after the cancer diagnosis to 1.19 ± 0.32 episodes per month compared with 0.12 ± 0.21 episodes per month before the diagnosis, which represents a 10-fold increase in arrhythmia burden ($P = 0.031$). The most common malignancies were skin (25%), prostate (12%), and breast (12%). The incidence of ventricular arrhythmia was significantly higher in patients with stage IV metastatic cancer than in those with earlier stages (I-III) ($P = 0.03$) (Fig. 1).

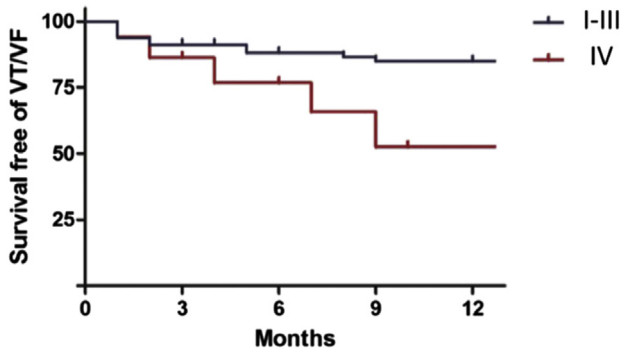

Figure 1. Kaplan-Meier curve showing survival free of ventricular tachycardia/ventricular fibrillation (VT/VF) after diagnosis of cancer in patients with stage IV disease versus patients without systemic dissemination (stages I- III; log-rank $P = 0.033$). Reproduced from Enriquez et al.[2] with permission from Elsevier.

Multiple pathophysiological mechanisms can contribute to the increased ventricular arrhythmia in patients with cancer. As noted by Moudgil and Yeh,[1] certain chemotherapeutic agents and supportive therapy (antiemetic agents, antidepressants) have a propensity to prolong the QT interval, leading to ventricular arrhythmia. The 2016 Canadian Cardiovascular Society guideline supports baseline electrocardiography and periodic monitoring of the QTc interval during cancer treatment in patients receiving QTc-prolonging agents.[3] Other proarrhythmic triggers include the upregulation of inflammation in the setting of advanced cancer,[4] direct cardiac involvement by tumor (primary or metastasis), or electrolyte imbalance secondary to vomiting, diarrhea, or decreased oral intake. Further studies are needed to better elucidate the causal relationship between cancer, cancer treatment, and cardiac arrhythmias.

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Disclosures

The authors have no conflicts of interest to disclose.

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