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Device detected arrhythmias - Staying afloat in the data deluge

Pacemakers have long ceased to be devices that only provide pacing support for bradycardia. The advanced devices of today not only provide various optimizations of pacing parameters, but also record high rates in either chamber, providing data that may sometimes be valuable, but often leave the treating physician at a loss on how to deal with this information. The significance of atrial high rates (AHR) recorded in pacemakers has been studied for some time now. Based on the evidence from multiple studies it appears that device detected AHR could be associated with a thromboembolic risk, when it lasts beyond a specified duration, and especially in the presence of other risk factors. This provides an opportunity to treat these high risk patients with anticoagulation and potentially prevent strokes.

Our understanding of what to do with ventricular high rate (VHR) events, on the other hand, is less complete at present. Extrapolating from the existing evidence on non sustained VT (NSVT), the significance of device detected VHR may be separately considered in three different groups based on their left ventricular (LV) function.

In patients with severe LV dysfunction, the additional prognostic value of non sustained VT appears to be small. In the ESSEM trial [1], LV ejection fraction was the most important determinant of outcomes and NSVT was not predictive of outcomes in multivariate analysis. In the current era where a high proportion of these patients are treated with beta blockers, any prognostic utility of NSVT may be even more blunted [2]. However, these patients are eligible for implantable cardioverter defibrillators because of the low LVEF alone and therefore the presence or absence of NSVT does not guide us in management.

In patients with normal LV function, identification of asymptomatic non sustained VT has been considered to carry no prognostic significance [3]. Although patients with a pacemaker have some form of conduction disease requiring pacing, they usually do not have significant LV dysfunction. Therefore we would expect that NSVT is associated with a benign prognosis in them. Previous studies have also shown that the identification of VHR is not associated with increased mortality [4]. In this issue, Isath et al. found that in 502 patients with pacemakers, device detected VHR was not associated with adverse outcomes during follow up [5]. The number of VHR episodes or the ventricular rate during the VHR were likewise also not associated with mortality. They took care to include only those episodes that could be identified as true non sustained VT. This reinforces the conclusion that these VHR episodes add no prognostic information in these patients.

The one setting where VHR might be important in predicting

outcomes and prompting interventions is patients with LV dysfunction not severe enough to warrant ICD placement by itself. In this study, in a subset of patients with EF < 40%, the authors found no relation of adverse outcomes to VHR, although the sample size was small. This is consistent with findings from a previous study in 326 patients with ejection fraction between 35 and 50% where device detected VHR was common, but presence or duration of VHR was not associated with survival [6].

The consensus bolstered by all these pieces of data seems to be that device detected VHR, unlike AHR, may not carry any prognostic import. This definitely is the case for patients with a normal LV function, but also appears to be true for those with LV dysfunction. Although in the latter group, one would be cautious until more data is available and it may be necessary to assess these patients in light of any additional risk factors they might have.

Stepping back and looking at the bigger picture, the data presently coming to us from implanted devices only represents the tip of the iceberg compared to the flood of rhythm related data we can expect to see in the near future with the proliferation of personal wearables that can monitor rhythm and their incorporation into the internet of things. Soon we are going to be pounded by uncertainty about the significance of incidentally detected rhythm abnormalities in healthy men and women. Learning to deal with pacemaker detected high rates is perhaps a way for us to prepare to stay afloat when this deluge of data arrives.

Disclosures

None for any of the authors.

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