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Syncope and Mortality: The Critical Component of the Pathway or an Innocent Bystander?

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I recall being shown a pre-excited electrocardiogram as a medical resident. The delta wave jumped out prominently off of the page, and became the focus of my attention. When I was next shown a wide complex tachycardia with a similar morphology, I immediately jumped to the conclusion that the accessory pathway was the cause of that tachycardia. This conclusion was not correct. As any 1st year electrophysiology fellow knows, it is important to tease out whether the accessory pathway is a critical component of the reentrant circuit or merely a bystander, grabbing one's attention but not truly relevant to the tachycardia.

The clinical presentation of syncope can be dramatic for both the patient and the physician. Syncope represents a large milestone event that patients can often recall with vivid detail. Similarly, the presentation of syncope can take on outsized importance in the emergency room. There have been several studies that have assessed the prognostic significance of syncope in patients presenting to the emergency room^{1–5}. Studies have reported clinical and laboratory parameters that predicted mortality at 1 month or longer^{2–5}, and several studies have reported that an abnormal electrocardiogram was associated with poor outcomes^{2–7}.

While the worse 1-year prognosis with an abnormal electrocardiogram has been well documented, the specific electrocardiographic abnormalities have not. In this issue of *Heart Rhythm*, Pérez-Rodon et al. report on findings from the Group for Syncope Study in the Emergency Room (GESINUR), a prospective Spanish observational, multicenter study⁸. They studied 524 patients who had interpretable electrocardiograms and 1-year follow-up. Overall, there were 33 deaths (6.3%) at 1 year. There were 4 different electrocardiographic

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predictors of all-cause mortality at 1 year: atrial fibrillation (odds ratio [OR] = 6.8), inter-ventricular conduction delay (OR = 3.8), left ventricular hypertrophy (OR = 6.3), and a ventricular paced rhythm (OR = 21.8). The authors are to be congratulated for elucidating specific electrocardiographic rhythms that are associated with a poor prognosis.

Unfortunately, a closer look at the data only increases the reader's confusion. While one might expect deaths related to an abnormal electrocardiogram to be arrhythmic deaths, only 1 suffered from sudden cardiac death. Over 45% of the deaths were deemed to be non-cardiovascular deaths. It is not clear how an episode of syncope would lead to a non-cardiovascular death several months later.

This study raises some fundamental questions. First, although there is an association between syncope and increased 1-year mortality, does the syncope contribute to the increased 1-year mortality? Or is the syncope just an innocent bystander – the focus of clinical attention but not the true culprit. One way to answer this question would be to follow a cohort of patients from the emergency room for 1-year who did not present with syncope, and compare the 1-year event rates for each of these electrocardiographic abnormalities to those patients who did present with syncope. This type of study could answer the key clinical question raised by this study, which is whether syncope is critical to the increased risk of mortality or just an innocent bystander.

The second question is about the relevance of these data to the physicians in the emergency department. Was it important that these patients were recruited in the emergency department or was the emergency department just a convenient location to recruit these patients? How should an emergency physician respond to the knowledge about risk factors for 1-year mortality? While 1-year prognosis in syncope is of academic interest, this knowledge is not of practical interest in the emergency room. What our colleagues in the emergency room need are predictors of acute risks that are amenable to acute intervention that could ameliorate that risk⁹.

The cardiac electrophysiologist will likely have more interest in 1-year prognosis due to their longitudinal care of the patient. Even here, however, it is not clear how the cardiac electrophysiologist should respond to the knowledge that a patient presenting with syncope and a ventricular paced rhythm has a 21-fold increased risk of 1-year mortality compared to a patient without external ventricular pacing. In this study, <5% of patients experienced sudden cardiac death, and there was an almost 50% chance of a non-cardiovascular mode of death.

Until we get further data to the contrary, I suspect that syncope in the setting of an emergency department presentation is a bystander on the path to mortality at 1-year. Syncope may be a marker of more general illness in older adults, but not integral to the mechanism of death in these patients. Although this study informs us about markers of increased risk of death in patients presenting with syncope, it is still not clear that this risk can be reduced.

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