EDITORIAL COMMENTARY

Nocturnal enuresis and sudden death—For whom the bell tolls?

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Sudden death in young people usually occurs at night, during sleep1; indeed, death during sleep or rest is more than 10 times more common than death during sport.2 Daytime syncope and cardiac arrest provide a warning that may lead to the detection of a potentially lethal yet manageable inherited cardiac condition such as long QT syndrome, catecholaminergic polymorphic ventricular tachycardia, or hypertrophic cardiomyopathy.3 In contrast, nocturnal syncope is usually unrecognized unless a co-sleeping partner detects agonal respiration or a seizure. In consequence, after a nocturnal near-miss cardiac event, there is usually no investigation, and the individual and potentially an entire family with a heritable condition remains undetected and at continued risk of preventable sudden cardia death. The detection of nocturnal near-miss events might therefore greatly reduce sudden death in young people.

In this issue of Heart Rhythm Journal, Chorin et al4 describe the tragic sudden unexpected nocturnal death of a 23-year-old woman. Her medical history was remarkable for only 2 episodes of nocturnal enuresis, occurring at age 18 and 20 years. Ultimately the diagnosis of long QT syndrome type 2 was made through cardiac and genetic investigation of the mother. The family history included 2 young sudden deaths. The authors proposed that a family history of premature sudden death, and an electrocardiogram (ECG), should be part of the investigation for such cases. When a survey found that only 1% of pediatricians and physicians would have performed ECG as part of the investigation in such a presentation, the authors proposed that this represents a paradigm shift in the investigation of nocturnal enuresis.

It is well known that enuresis can occur with loss of consciousness, during a seizure, and seizures can be secondary to malignant arrhythmia. To a heart rhythm specialist, it would seem logical to consider that nocturnal enuresis might signify a malignant arrhythmia.

Similar cases, however, seem to be few in the literature. A 45-year-old man had 3 episodes of nocturnal enuresis, but his Brugada syndrome was recognized only when, aged 50, his wife noticed him groan at night and become unresponsive. He was ultimately shocked out of ventricular fibrillation.5 A 17-year-old adolescent girl presented with 2 episodes of nocturnal enuresis associated with seizure. A digital loop recorder later documented torsades de pointes at the time of an event, and (genotype unknown) long QT syndrome was diagnosed.6 Brugada syndrome and long QT syndrome types 2 and 3 are known to be associated with nocturnal death.

In New Zealand’s National Cardiac Inherited Disease Registry, one-third of the probands with long QT syndrome were initially misdiagnosed with seizure disorder. It is not known how common “isolated” enuresis occurs as a primary event in long QT syndrome. However, enuresis will not have usually been inquired in routine history taking, and the family may not have seen the relevance of reporting it.

Enuresis in childhood is extremely common; indeed, it is a normal developmental process, decreasing from 20% in 5-year-olds to 1%–2% in young adults.8 The majority (80%–90%) of children with enuresis have primary enuresis. However, a small group of children and adults have secondary enuresis (enuresis in someone who has attained nighttime urinary continence for at least 6 months). Recognized causes of secondary nocturnal enuresis include behavioral psychopathologies,9 urinary tract infections, diabetes mellitus and insipidus, sexual abuse, and seizure disorders.10

Heart rhythm specialists should note that techniques to manage nocturnal enuresis may be applied to our patients who we manage with arrhythmia conditions. Techniques include enuresis alarm therapy11 and medications including desmopressin, tricyclic antidepressants,12 and anticholinergics.13 Our patients with coincident long QT syndrome type 2, vulnerable to startle, will need to avoid an alarm designed to go off when a person wets, as well as avoiding QT-prolonging medications.
The alert presented by the case report by Chorin et al presents a challenge to physicians who deal with enuresis. It is clearly not appropriate to initiate cardiac investigations in the vast majority of patients with nocturnal enuresis, most of whom have primary enuresis. It may be that a small subgroup of the 10% of patients with secondary enuresis who have sporadic enuresis (occurring less than 3 monthly) could be identified and be considered “atypical” and warrant consideration of arrhythmia. The infrequency of enuresis caused by syncope may mean that such cases would be more likely to present to the family doctor rather than to an enuresis specialist. Other red flags would be a personal or family history of syncope or seizure, but this will require that the right questions are asked.

While an ECG may be a simple investigation for a cardiologist, even obtaining one can be an issue for community physicians, and the interpretation of it can present considerable challenges. How many community pediatricians will recognize a Brugada ECG signature? Very few, we would suggest.

In the case report by Chorin et al, there was clearly a family history of young sudden death, which, once identified, should itself lead to cardiac genetic family screening. Taking a family history for early death is recommended as part of any pediatric examination in primary care pediatrics and also has a high diagnostic yield in the investigation of syncope. Taking such a family history is quick, cheap, universally available, and effective; it would seem appropriate to emphasize its potential significance in occasional sporadic nocturnal enuresis in teenagers and adults.

Chorin et al have highlighted an area that deserves focus. Nocturnal enuresis can be the presenting feature of life-threatening arrhythmia, and failure to recognize this can be lethal. The heart rhythm community should now aim to identify how common this presentation is in patients with proven malignant arrhythmia. Meanwhile, we concur with Chorin et al that it is appropriate to raise awareness among primary care physicians and pediatricians that potentially lethal arrhythmic conditions can present with sporadic secondary nocturnal enuresis and that these conditions are often detectable via family and clinical history in combination with an ECG.

References