Mortality Risk and Hospital Admission after a Brief Resolved Unexplained Event

In a meta-analysis in this volume of The Journal, Brand et al attempted to address a common problem faced by both parents and pediatricians. Should a child be admitted to the hospital after a brief resolved unexplained event (BRUE)? The authors calculate risk of death 4 months after a hospital evaluation for an apparent life-threatening event (ALTE) by evaluating ALTE studies published since 1970. They identify 8 deaths and determine the mortality risk to be 1 in 800. They also conclude that routine hospitalization is unnecessary, because this rate is similar to or lower than the baseline risk of death during the first year of life. The authors state this finding supports the recommendation by the American Academy of Pediatrics (AAP) BRUE Guideline against routine hospitalization for patients classified as “lower risk.”

A historical perspective is needed to apply decades-old ALTE research to today’s patient with a BRUE. The term ALTE was proposed in 1986, at perhaps the height of public alarm for sudden infant death syndrome, in an attempt to better categorize, study, and manage the increase in caregiver concerns for events that they themselves perceived as life threatening. This definition included children who appeared well and those with ongoing symptoms (eg, fever, work of breathing, or mental status changes). The term also encompassed situations where the clinician could readily explain the event (eg, gastroesophageal reflux or breath holding spell).

In other words, the term ALTE defined a chief complaint regardless of the child’s initial appearance or ability of a clinician to explain the event. Eventually, the term took on an additional meaning and was used to describe a discharge diagnosis (with its own code in the International Classification of Diseases, 9th edition) in situations where the child appeared well and the clinician could not explain the event.

The nonspecific nature of the term ALTE complicates the synthesis of the literature for evidence- and risk-based management strategies. As a thought experiment, this exercise would be equivalent to the study of risk in febrile children without an objective marker for fever or consideration of other important factors, such as the patient’s symptoms, age, prematurity, and physical examination. These factors matter. When caregivers seek care after a concerning event, a careful history
and physical examination can often guide management. Because newborns have immature neurologic and gastrointestinal systems, clinicians can often characterize an event as something relatively normal and benign (eg, periodic breathing of the newborn, breath holding spell, or gastroesophageal reflux). The presence of respiratory or neurologic symptoms, a past medical history of events, and bruising on examination can also affect risk calculations. Probably even more to the point, the caregivers’ experience affects the perceived risk and benefit of hospitalization. The ALTE literature does not consistently report these important factors, defying a straightforward interpretation of risk.

To address these problems, the term ALTE was more specifically defined as a BRUE by the AAP in a recent guideline. A BRUE only includes patients without ongoing symptoms and without an explanation for the event after a thorough history and physical examination. In other words, it does not describe a chief complaint, but is a diagnosis of exclusion. A BRUE includes the subset of patients with an ALTE where caregivers and clinicians are faced with diagnostic uncertainty after the initial evaluation. The AAP BRUE guideline also addresses a multitude of risk factors by incorporating evidence and expert opinion to define a group of patients who, based on age, repeat events, prematurity, event duration, and use of CPR, are extremely unlikely to have another event or a serious underlying diagnosis. These lower risk patients do not need routine hospitalization (or testing).

Although I agree with the authors’ conclusion that routine hospitalization is unnecessary, there are important study limitations and family preferences to consider. First, the authors’ 1 of 800 estimate is too conservative. The calculated mortality rate would be much lower if the authors had excluded patients who did not qualify as a BRUE (eg, a patient with ongoing respiratory or neurologic symptoms) or excluded patients classified as higher risk (eg, <2 months, repeat events, cardiopulmonary resuscitation required, etc.). In fact, 4 of the 8 patients identified by Brand et al would not qualify as a lower risk BRUE because of young age, use of cardiopulmonary resuscitation, history of prematurity, prior ALTE, and ongoing respiratory symptoms. For example, 1 patient was even intubated upon arrival to the emergency department. Second, mortality is only one of many risks that can be addressed by an extended period of observation in a hospital. From a family-centered perspective, there is the risk of hospitalization preventing mortality in those who lived or occurred in children that, from the initial history and physical examination, were suspected to be victims of child abuse. Clinicians should have a high index of suspicion for abuse and evaluate for bruising, torn frenulum, inconsistent event description, Munchhausen syndrome by proxy, and a family history of abuse. Child abuse evaluations and ongoing monitoring by trained child abuse experts need to be considered whenever there is an abuse concern.

Nonetheless, the findings by Brand et al are useful and can inform discussions on the benefit of hospitalization. In patients who qualify for a lower risk BRUE, there does not seem to be an increase in the risk of death. In fact, the risk is probably far lower than that calculated by the authors, particularly when the history and physical examination are normal and there is no concern for child abuse. Future work needs to focus on understanding the risk factors associated with BRUEs and to match management strategies to these risks. Routine hospitalization is unlikely the answer for either lower or higher risk patients with a BRUE. Rather, clinicians need to focus on the specific evaluations and support services that will minimize risk to a tolerable level for both the family and the medical community.

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References