BRUE (brief resolved unexplained event): Clinical Pearls

1. Definition

- An episode is defined as a BRUE if and only if all of the following are true.
    - BRIEF: Lasting under one minute in an infant less than one year old (of note, in BCH EBG this is not an inclusion criteria but instead denotes a low risk event)
    - RESOLVED: patient is back at their baseline.
    - UNEXPLAINED: with no other symptoms, signs, or explanation derived from the history and physical.
    - EVENT: a change in either color, central cyanosis or pallor; breathing, such as apnea; tone, hyper- or hypotonia; or mental status.
- If any of these criteria are not met, then this is not a BRUE and you must investigate and manage accordingly.
- If you observe abnormal vital signs or additional signs on physical exam such as respiratory distress, cyanosis, or abnormal movements, that's not a BRUE.
- If the episode is characterized by choking or gagging with emesis, then it is not a BRUE.

2. Epidemiology

- The term BRUE is new and replaced a previous category of apparent life-threatening events (ALTEs) in 2016.
- It is a relatively common complaint among young, otherwise healthy babies, occurring in up to 1% of all infants.

3. Risk Stratification

- Lower risk BRUEs are defined by five features.
    - Patient's age is greater than 60 days.
    - Gestational age was at least 32 weeks and post-conceptual age is at least 45 weeks.
    - No CPR by a trained medical provider was required.
    - Patient's first and only BRUE and duration was under one minute.
    - No concerning features on history and physical exam (see below), which would rule out the diagnosis of BRUE in the first place.

4. Disposition:

- Lower risk BRUEs: Provide reassurance. Provide caregivers with education about BRUEs and CPR training resources. No indication to admit these patients for observation nor order any further tests or prescribe any treatments. However, you can briefly monitor patients for one to four hours with serial exams and pulse oximetry to ensure ongoing stability and to continue the search for an alternative diagnosis to BRUE such as by observing a breath-holding episode or reflux.
- While there is no known association between lower risk BRUEs and sudden infant death syndrome, or SIDS, you may take this opportunity to educate caregivers about routine measures like safe sleep to prevent SIDS.

- If higher risk or clinical concerns, consider admitting for cardiorespiratory monitoring for 6-24 hrs; including through two feeds, sleep and awake state

5. Diagnostic Evaluation

- Characterize the event and the events that preceded it, including where the infant was and what they were doing, whether they were feeding or had recently fed, and what position they were in. It is important to note who witnessed the event, how long it lasted, and whether an intervention such as CPR was required to make the event resolve.
- Thoroughly review past medical, social, developmental, environmental, and family histories.
- Several do not miss diagnoses (cardiopulmonary disease, abuse, and serious infections) as well as several more common underlying causes (gastroesophageal reflux, respiratory infections, and seizures).
- By system:
    - Cardiac: ask about failure to thrive, feeding or respiratory problems, family history of sudden unexplained death/long QT, or sibling with BRUE. Listen for murmurs or irregular heart rate. Consider cardiology consult and EKG. If murmur present, consider CXR.
    - Neurologic: Ask about rhythmic or abnormal eye or limb movements and inquire about family history of seizure in any first or second degree relatives. Consider neurology consult and EEG.
    - Respiratory: Listen on exam for paroxysmal cough (could be consistent with pertussis, particularly if there is an exposure history), wheezing/coarse breath sounds and tachypnea (could be consistent with bronchiolitis) or stridor (could be consistent with upper airway obstruction). Manage the respiratory tract infectious as you would otherwise, but consider ORL involvement if stridor present and presentation not otherwise consistent with croup.
    - Infectious: Obtain a full immunization history and ask about recent fevers, sick contacts, or rashes. Evaluate vital signs and whether child looks sick. Consider CBC, cultures, and CXR as indicated.
    - Nutritional/feeding: To evaluate for reflex or aspiration, you should ask about feeding habits, including whether the infant is breast or bottle-fed, how much and how often they drink, and any difficulties with coughing, gagging, choking, or emesis during or after feeds. Consider feeding team evaluation if any of these findings are present, or to evaluate for laryngospasm (a protective reflex that can underlie a BRUE). Evaluate growth chart to ensure presentation is not consistent with failure to thrive.
    - Trauma: Look for red flags, including whether the story is consistent with clinical picture or developmentally appropriate. To evaluate for abuse, you should ask about similar events in siblings, the presence of a mental illness or drugs in the home. On exam, look for multiple injuries, bruises, a torn frenulum, a bulging fontanelle or HC >95%ile or increasing. If these red flags are present, pursue a non-accidental trauma evaluation (or an evaluation for increased ICP if applicable).

- If finished with thorough history and physical as above with no concerning features pointing towards an underlying etiology for the event then the diagnosis is BRUE.

Sources:

BCH Evidence based guideline

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