Reflex anoxic seizures in a toddler

Tilak de Almeida, Victoria Pennock, Jonathan R Skinner

Abstract

We report a toddler with frequent pallid type breath-holding or reflex anoxic seizure episodes successfully treated with pacemaker implantation. A rhythm strip (from an ambulatory ECG monitor that shows an 18-second period of asystole) is shown.

A 10-month-old girl, with normal neurological development following an uneventful perinatal period, presented to our Emergency Department with a 2-month history of syncope and seizures. They were occurring up to several times a day. Most episodes were precipitated by crying while others were caused by a sudden startle without crying; some were associated with breath-holding.

Over the next few months it became clear that most of the spells occur following a sudden startle without a tantrum or crying. Most episodes were associated with loss of consciousness and arching of the back. Post event she was unsteady and would sleep for about an hour.

Her inter-episode ECG, EEG and iron profile were all normal. At age 14 months, one such episode was captured on a Holter monitor, as shown below.
The ambulatory ECG rhythm strip shows an 18-second period of asystole. The arrow indicates activation of the monitor by the child’s mother during an episode.

These episodes are pallid-type breath-holding episodes or reflex anoxic seizures. Pallid-type breath-holding spells are a form of cardioinhibitory neurocardiogenic syncope. It is a parasympathetically mediated event causing asystole in response to a sudden startle. During this self-reverting transient asystole, the infant goes pale, loses consciousness and may have a seizure.

The other common type is the cyanotic type of breath-holding, where the infant cries and holds their breath in expiratory apnoea resulting in cyanosis and loss of consciousness. Breath-holding spells have been reported to occur in up to 4% of children. It is said that 20% of infants experience both types of spells with one type predominating.

In both types, almost all these families require reassurance and avoidance of precipitating situations only, as almost all of these toddlers grow out of these events. Atropine has been tried as a treatment with limited success, and administration is difficult.\(^1\) Cardiac pacemaker implantation is reserved for the most severe forms.\(^2\)

The episodes were causing immense anxiety to the caregivers of our patient. Atropine sulphate orally was initiated which reduced the frequency of episodes from 10-15 fortnightly to 6-8 per fortnight.

At specialist cardiology consultation, pacemaker implantation was recommended, and whilst the caregivers considered this option an oral beta-blocker was tried without success.

As the episodes continued on an almost daily basis, the family elected for pacemaker implantation. A dual-chamber epicardial pacemaker with rate drop detection was implanted at the tertiary hospital cardiology unit. At follow-up the mother reported complete resolution of spells after the pacemaker was implanted. She said that the placement of the pacemaker had “changed all our lives for the better.”

Breath-holding spells are usually innocent disorders that show resolution with time. However, in the isolated severe case unresponsive to medication and associated with seizures and family anxiety, pacemaker intervention should be considered.

**Author information:** Tilak de Almeida, Senior Medical Officer in Paediatrics, Waikato District Health Board, Hamilton; Victoria Pennock, Paediatric Registrar; Waikato District Health Board, Hamilton. Jonathan R Skinner, Cardiologist, Greenlane Paediatric and Congenital Cardiac Services, Auckland District Health Board, Auckland.

**Correspondence:** Dr Tilak de Almeida, Department of Paediatrics, Waikato District Health Board, Pembroke Street, Hamilton, New Zealand. Email: tilak.dealmeida@waikatohealth.govt.nz

**References:**
