

Clinical Case Study: aEEG Monitoring on Infant with Recurring Apnea

Patient Characteristics

LL was a term male infant transferred from an outlying hospital with respiratory distress and apnea.

Mother was G1, P0 and GBS negative. She was admitted for induction at 39½ weeks gestation after an uneventful pregnancy until pregnancy-induced hypertension appeared a few days prior to delivery. Membranes were ruptured 28 hours prior to delivery; fluid was clear. She developed a fever of 100.8 degrees during labor, while receiving epidural analgesia. There was no evidence of fetal distress. A single dose of Ancef was given, then C-section was performed for failure to progress.

Apgar scores were 8 and 8; birth weight was 3030 grams, with symmetrical OFC and length measurements. The baby required supplemental O₂ in the delivery room, then continued to have mild grunting and tachypnea in the nursery. He was placed in hood O₂, and stabilized in 36% O₂. A blood culture and CBC were obtained, and he was started on antibiotics. A few hours after delivery, he continued to have mild respiratory distress but had also developed apnea, so transfer was arranged to our NICU.

Initial Exam and Clinical Impression

Upon arrival of our transport team the baby had another episode of apnea, so he was started on CPAP. He improved rapidly after admission to our NICU, and weaned off CPAP into room air later on day one. His CBCs were normal and blood culture was negative, so antibiotics were stopped after two days.

The initial physical exam was unremarkable except for mild dyspnea, but the chemistry profile was notable for a Na of 125, Mg of 1.2, and elevated AST/ALT/GGTP. These abnormalities steadily improved after day one.

Apnea recurred after the CPAP was stopped, but was mild until three days of age, when it became more severe, requiring a resumption of nasal cannula flow. An LP was performed but only a scant amount of fluid was obtained, which was sent for herpes PCR. He was started on acyclovir, but that was discontinued when the PCR came back negative.

aEEG monitoring was begun, and showed repetitive seizure activity on the left. He was given 20 mg/kg of phenobarbital with marked improvement in the electrographic seizure frequency but some seizure activity persisted, so he was given an additional 20 mg/kg of phenobarbital. Clinical symptoms, which had been limited to apnea, resolved, but a full-montage EEG showed continued seizure activity, so fosphenytoin was added to his regimen. MRI showed a large region of restricted diffusion consistent with a right MCA distribution infarct with additional areas of restricted diffusion extending into the right pons and midbrain, as well as small foci in the periventricular white matter on the left.

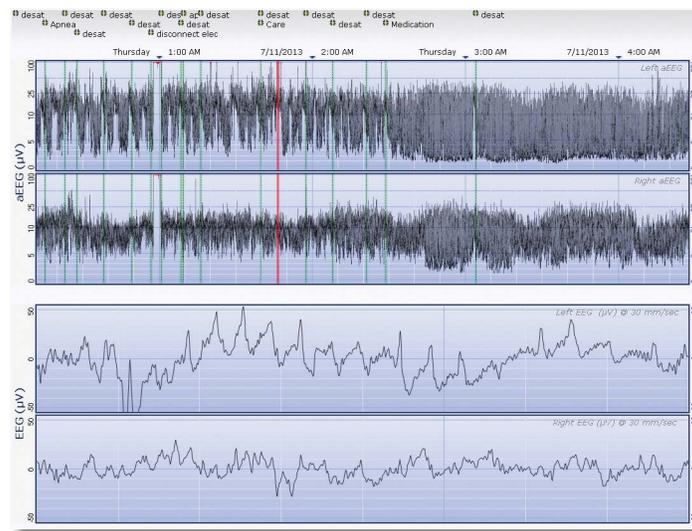
He was weaned off respiratory support by 5 days of age, and a follow-up EEG showed no seizure activity but continued bitemporal sharp transients, left>right. Fosphenytoin was discontinued, and he was discharged home on maintenance phenobarbital.

Discussion

Apnea in the full-term infant is always abnormal, but has many potential causes. Sepsis is usually the first consideration, but was eventually ruled out in this infant. A favorable response to nasal CPAP or flow does not exclude the diagnosis of seizures, which became evident as soon as aEEG was begun, and these were much more frequent electrographically than was evident from the clinical episodes of apnea. In spite of what appeared to be a mostly benign pregnancy, labor and delivery, this infant had extensive brain injury, probably occurring shortly before birth. Abnormalities in the chemistry profile were another clue to this injury.

An unknown in this case is the time of onset of the seizures. It could have been as early as the first apneic episode in the first hours of life, but this was not suspected as a seizure because of the favorable response to CPAP and the availability of a more obvious cause in the form of possible sepsis. It is possible, perhaps even likely, that this infant had recurrent seizures throughout the first three days of life until aEEG monitoring was begun, suggesting that a very low index of suspicion should be in place for apnea as a manifestation of seizures in the full term infant.

aEEG & EEG Tracings



Robert White, MD

Director, Regional Newborn Program, Memorial Hospital
South Bend, IN, USA