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Clinical letter

A case of infant hot water epilepsy: A clinical commentary with video sequences

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1. Case report

Hot water epilepsy in infants is a type of reflex epilepsy and is categorized as a provoked epilepsy. The seizures are precipitated when the infant is placed in water at a temperature above 37.5 °C [1]. The published literature contains several cases of seizures provoked by bathing in lukewarm water, which are described as hot water epilepsy [2].

This report presents a case of hot water epilepsy in a 7-month-old Caucasian infant.

A 7-month-old infant was admitted to our hospital after two episodes of unresponsiveness while bathing. His mother noticed that after immersing of the lower part of the infant's body in water, he suddenly became activity arrested, confused, experienced glazed–eyed staring and had facial cyanosis for approximately 1 min. At the end of the attack, the child fell asleep for approximately half an hour. After awakening, he was alert and looked well.

The infant was the only child in the family, and the mother had an uneventful pregnancy and delivery. The child had attained normal developmental milestones. The family history was negative for epilepsy and febrile seizures. The child had normal neurological examination results, psychological status, laboratory tests, and neuroimaging analyses. An electrocardiogram (ECG) demonstrated sinus rhythm with a normal QT interval. An interictal electroencephalogram (EEG) was performed while the child was awake, and the results exhibited normal background activity with no epileptic discharges. During sleep, the EEG showed normal sleep organization with intermittent sleep spindles. There were no abnormal discharges identified.

A seizure episode was triggered by imitating the home bathing conditions. The mother adjusted the water temperature to 40 °C. 14 s after immersion, the mother felt the infant become limp (video-sequence 1). The child became motionless, stared, appeared confused and cyanotic and developed an opistotonic posture. Once removed from the tub, the infant was initially hypotonic and subsequently had a hypertonic arm posture. During the last seconds of the episode, oral automatisms were observed. There was postictal nose wiping with the left hand. The child subsequently opened his eyes in approximately 10 s and was alert.

We attempted to provoke an episode by placing the infant in a hot bath whilst EEG video monitoring was performed. The EEG technician who was holding the infant during recording felt the infant become limp 10 s after immersion. A complex partial type seizure occurred and lasted approximately half a minute. This seizure was less profound than the previous seizure (video-EEG sequence 2). The initial manifestations were immobility, confusion and hypotonia with a 2- to 3-Hz pattern of high voltage waves above the frontocentral regions. A slow rhythm rapidly spread above the temporal region on both sides and there were further diffuse disseminations and clinical correlates, such as oral and left hand automatisms. The child had spontaneous seizure cessation.

The child was diagnosed with hot water epilepsy. We recommended changing the bathing habits and bathing the child in lukewarm water (35–37 °C). The boy experienced no seizures during a period of one year, and his psychomotor development was normal.

2. Discussion

A diagnosis of hot water epilepsy in our 7-month-old infant was established based on the anamnesis, witnessed events, and the EEG findings.

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Hot water epilepsy in infants occurs predominately in males. The most frequent phenomenology of the seizures is complex partial seizures. Seizures may manifest with a dazed look, activity arrest, or complex automatisms. Additional symptoms include unresponsiveness, hypotonia or hypertonia, and cyanosis. A seizure may occur at any time during bathing, and it usually persists for 30 s to 3 min [1]. The clinical semiology of our patient showed the complex partial nature of seizures. The presence of oroalimentary and left hand automatism together with the EEG features suggest temporal lobe involvement in the epileptogenic process. The postictal nose wiping with the left hand noticed on video sequence 1 suggests that the origin is located in the left hemisphere [3].

Ictal EEG is seldom obtained in patients with hot water epilepsy [2]. In the published cases, typical discharges were focal or unilateral high-voltage delta activity with fast generalization at all electrodes [4]. The ictal EEG in our patient showed initial bilateral slowing of activity presented by a delta rhythm above the frontocentral regions, which was followed by spreading and generalization of slow waves. An underlying structural abnormality in our patient was excluded with a normal brain magnetic resonance imaging.

Hot water epilepsy can mimic a range of bath-induced paroxysmal events in infancy, including the following: alternating hemiplegia of childhood, hyperekplexia, paroxismal extreme pain disorder, aquagenic urticaria and infantile syncope [2]. The ictal video-EEG in our case excludes the possibility of non-epileptic paroxysmal disorders. It is often confused with bathing epilepsy, which has been described in children worldwide and presents with focal seizures. This condition is precipitated by domestic bathing in water at "normal" temperature (36–38 °C) [2]. Decreasing the temperature of water to 33 °C could be an effective treatment for those infants [1]. In this study, we describe an infant affected by hot water epilepsy that is triggered by immersion of the lower part of the body in 40 °C water. We differentiate hot water epilepsy in our infant from other published cases from Western countries [2,4] because seizure control was achieved by lowering the water temperature to 37 °C during the one-year follow-up period. HWE in infants is self-limited as the seizures stop spontaneously after the age of 3 years, and psychomotor development remains normal [1].

In conclusion, we report an infant diagnosed with hot water epilepsy. The video EEG of our patient augments the limited number of video-reported seizures provoked by hot but not lukewarm water in an infant of Caucasian origin.

Conflict of interest statement

The authors declare no conflict of interest.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.seizure.2015.06.008.

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