Intussusception Initially Diagnosed as a Brief Resolved Unexplained Event (BRUE)

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Abstract

Brief resolved unexplained event (BRUE) are transient and worrying episodes observed in infants and are characterized by changes in skin color, breathing, muscle tone, and/or responsiveness. We describe the case of a female infant who was initially diagnosed with BRUE but was later determined to have intussusception. She presented to our emergency department with a transient pallor and a single episode of vomiting that resolved before her visit. Physicians did not detect any abnormalities on physical or laboratory examinations, so she was diagnosed with BRUE and discharged to be re-evaluated the next day. After returning home, she vomited several times. The patient revisited our hospital the following day and was definitively diagnosed with intussusception using ultrasonography, which was successfully treated using fluoroscopy-guided hydrostatic reduction. This case was initially diagnosed as a BRUE; however, re-evaluation helped in identifying the proper diagnosis of intussusception. Physicians should exercise caution when diagnosing patients with BRUE. When the diagnostic criteria are not completely met, follow-up should be conducted, assuming that the patient has a potentially serious condition.

Introduction

In 2016, the American Academy of Pediatrics proposed replacing the term "apparent life-threatening event" (ALTE) with "brief resolved unexplained event" (BRUE) [1]. ALTE was originally developed as a term in 1986 to replace "near-miss sudden infant death syndrome" and involved the use of various examinations and in-hospital observation to exclude serious conditions from the differential diagnoses [1]. However, serious conditions are rarely found, despite many unnecessary tests and hospitalizations [2]. By contrast, patients defined as lower risk under the BRUE guidelines require minimal additional evaluations and observations, leading to a reduction in tests and hospitalizations [3]. Despite these benefits, the complete replacement of ALTE with BRUE can be difficult, and pitfalls may exist in the process [4]. Herein, we report a case of intussusception initially diagnosed as a lower-risk BRUE with a pallor at presentation. Our aim was to remind physicians of the importance of exercising caution when diagnosing BRUE.

Case Presentation

A four-month-old infant presented to our hospital with acute pallor. She had no symptoms prior to 11 p.m., when she was fed. On the same day, she suddenly began crying, swinging her limbs and head. After experiencing these symptoms, her mother noticed that her face had become pale. All symptoms improved before her visit. Physicians did not detect any abnormalities on physical or laboratory examinations, so she was diagnosed with BRUE and discharged to be re-evaluated the next day. After returning home, she vomited several times. The patient revisited our hospital the following day and was definitively diagnosed with intussusception using ultrasonography, which was successfully treated using fluoroscopy-guided hydrostatic reduction. This case was initially diagnosed as a BRUE; however, re-evaluation helped in identifying the proper diagnosis of intussusception. Physicians should exercise caution when diagnosing patients with BRUE. When the diagnostic criteria are not completely met, follow-up should be conducted, assuming that the patient has a potentially serious condition.

The physical examination and blood test results were unremarkable; the patient’s vital signs were: oxygen saturation of 97% in room air, a heart rate of 147 beats per minute, and a temperature of 36.7°C. Although the physician suspected the possibility of myocarditis, the function of the heart was found to be normal. The patient demonstrated no symptoms during follow-up observations for several hours and was able to drink milk in the emergency outpatient department. The physician confirmed the patient’s medical history as well as the results of the physical and laboratory examinations and did not detect any abnormalities. Thus, the patient was diagnosed with low-risk BRUE. She was then discharged and referred to our hospital the following morning.

After returning home, the patient did not experience any more episodes of pallor, the chief complaint on the first visit, but did vomit non-bilious emesis repeatedly during the night. The next day, she revisited our hospital following the physician’s instructions, and an abdominal ultrasound was performed. A characteristic “target sign” was observed in her hepatic region (Figure 1), which led to a diagnosis of intussusception. The patient was then admitted for immediate treatment.

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Abdominal ultrasonography shows a "target sign" in the patient’s hepatic region. No echo patterns are observed in the surrounding areas.

Ultrasound- and fluoroscopy-guided hydrostatic reduction was performed using a water-soluble contrast agent, Gastrografin, suspended at a height of 90 cm. A "coiled-spring sign" was seen in the hepatic hilar region (Figure 2).
Fluoroscopy shows a "coiled-spring sign" in the hepatic hilar region.

The intussusception was not resolved after the first reduction attempt (3 min) but was successfully resolved after the second. Although the patient was observed crying at night after the reduction, an abdominal ultrasound revealed no evidence of recurrence. Oral intake was resumed the day after the reduction, and the resolution of the alimentary tract obstruction was confirmed. Accordingly, we judged the intussusception to be completely reduced. The patient was discharged on the third day of hospitalization. At the time of writing this report, approximately six months after admission, the patient had not experienced any recurrence of symptoms.

**Discussion**

The classical triad of intussusception includes vomiting, bloody stools, and intermittent abdominal pain.
relationships or activities that could appear to have influenced the submitted work.

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