

Clinical Assessment of the Crying Infant Should Guide Decision Making

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March 25, 2009 - History and physical examination is the key to evaluate the crying infant and to determine testing, which should include urine evaluation for afebrile infants in the first few months of life, according to the results of a retrospective review reported in the March issue of Pediatrics.

"Although the differential diagnosis of crying is extensive, the frequency of severe underlying disease is unclear," write Stephen B. Freedman, MDCM, MSc, FRCPC, from Hospital for Sick Children, University of Toronto in Toronto, Ontario, Canada. "On the basis of very limited data, it has been recommended that corneal fluorescein staining, eyelid eversion, and rectal examination be performed on crying infants."

The goal of this study was to assess the proportion of children who have a serious underlying cause for crying evaluated in an emergency department. Secondary objectives were to examine the individual contributions of history, physical examination, and laboratory testing in reaching a diagnosis.

Records were reviewed for all afebrile patients younger than 1 year presenting to the emergency department with a chief complaint of crying, irritability, screaming, colic, or fussiness. Criteria defined a priori were used to identify all children with a serious underlying disease. To evaluate whether history, physical examination, or testing contributed to establishing the diagnosis, the investigators performed a chart review.

There were 237 patients, representing 0.6% of all visits, who met enrollment criteria. Serious underlying causes were present in 12 children (5.1%). Urinary tract infection was the most frequent of these causes, present in 3 children, and 2 (16.7%) of the serious diagnoses were reached only when the child was reevaluated.

Although the results of 81 (14.1%) of 574 tests performed were positive, only 8 diagnoses (1.4%) were reached because of a positive test result. In contrast, two thirds (66.3%) of cases were diagnosed in part because of suggestive findings on history and/or physical examination. Unwell appearance was noted in many infants that turned out to have various serious underlying conditions.

Gastroesophageal reflux disease was diagnosed based on clinical presentation in 13% of infants. This did not vary significantly by age.

In the absence of a suggestive clinical picture, testing contributed to the diagnosis in only 2 children (0.8%), both of whom were younger than 4 months and had urinary tract infections. The positive rate of urine culture results was 10% in children younger than 1 month. Ocular fluorescein staining and rectal examination with occult blood testing were rarely performed, and all results were negative. No missed diagnoses were found at follow-up, which was completed with 60% of caregivers.

"History and physical examination remains the cornerstone of the evaluation of the crying infant and should drive investigation selection," the study authors write. "Afebrile infants in the first few months of life should undergo urine evaluation. Other investigations should be performed on the basis of clinical findings."

Specific features of history and physical examination thought to be suggestive of specific conditions were as follows:

- Atypical colic: Colic diagnosed by the treating clinician but not meeting the definition of colic as described in the fourth bulleted item.
- Bacterial meningitis: Fever, paroxysmal irritability, lethargy, vomiting, full or bulging fontanelle, meningismus, positive results on cerebrospinal fluid culture.
- Bronchiolitis: Cough, fever, wheezing, rapid respirations, apnea, poor feeding, positive testing result for respiratory syncytial virus, evidence of bronchiolitis on imaging.
- Colic: Paroxysmal crying more than 3 hours per day, more than 3 days per week, lasting more than 3 weeks in an otherwise healthy child older than 3 weeks but younger than 4 months.
- Constipation: History of infrequent, hard stools that are difficult to pass, and palpation of small pellets on abdominal examination.
- Cow's milk allergy: Alleviation of symptoms when cow's milk is removed from the diet.
- Crying: No alternative findings that explain the episode.
- Gastroesophageal reflux: Visible regurgitation, refusal of feedings, Sandifer's syndrome.
- Hernia: History or physical examination revealing a bulge in the groin or umbilicus.
- Intussusception: Sudden onset of severe, intermittent abdominal pain; drawing up legs; well-appearing between episodes; vomiting, lethargy, bright red or occult blood in stool; "currant jelly" stools, sausage-shaped abdominal mass, imaging consistent with intussusception.
- Otitis media: Fever, ear discharge, pulling or rubbing the ear. Tympanic membrane findings include erythema, bulging, loss of landmarks, effusion, and/or reduced mobility.
- Pneumonia: Cough, fever, tachypnea, poor feeding, recent upper respiratory tract infection, leukocytosis ($> 20 \times 10^9$ white blood cells/L), focal findings on auscultation, imaging findings consistent with pneumonia.
- Urinary tract infection: Fever, malodorous urine, dysuria, frequency, vomiting, result of urinalysis positive for leukocyte esterase and/or nitrites; culture of catheter specimen result positive for at least 50,000 CFU/mL.
- Viral illness (herpangina, influenza, nasal congestion, roseola, upper respiratory tract infection, viral exanthem, or viral meningitis): Fever, cough, runny nose, nasal congestion, sneezing, vomiting, diarrhea, skin rash, contact with an ill person.

Limitations of this study include retrospective chart review, reducing accuracy and completeness of the abstracted data; absence of a uniform testing protocol, with tests performed on the basis of individual clinician clinical judgment; inability to make firm conclusions regarding the usefulness of tests that were infrequently performed; the possibility that patients who were discharged with a diagnosis of colic, atypical colic, or crying may have included some patients with serious undetected pathologic conditions; and lack of guarantee of causality from the presence of a diagnosed condition in individual cases.

"The etiology of crying ranges from benign to life-threatening," the study authors conclude. "A selective workup guided by clinical findings seems to be optimal....Other investigations such as rectal examination and fluorescein staining should be performed on the basis of the findings from the history and physical examination."

The study authors have disclosed no relevant financial relationships.

Pediatrics. 2009;123:841-848.

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