Evaluation and Management of Febrile, Well-appearing Young Infants

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KEYWORDS

• Fever • Infant • Serious bacterial infection • Viral illness • Management

KEY POINTS

- Urinary tract infection is the most common bacterial infection in young infants.
- Infants with certain viral infections are at lower risk for bacterial infection and can therefore be managed differently.
- Hospital admission and antimicrobial therapy should be avoided if possible for low-risk infants.
- When hospitalization occurs, length of stay and duration of antimicrobial therapy can be safely shortened to 24 to 36 hours.
- Adherence to a care process model can decrease the substantial variation in care of well-appearing febrile infants, can improve infant outcomes, and can reduce costs.

INTRODUCTION

The diagnosis and management of well-appearing, febrile infants younger than 90 days represents a common clinical conundrum encountered by child health care providers in ambulatory and hospital settings. Many febrile infants have no obvious focus of infection on physical examination. However, serious bacterial infection (SBI), including urinary tract infection (UTI), bacteremia, and/or meningitis, occurs in nearly 10% of febrile infants in this age range.[1–3] Fever may be the only sign of these infections, which, if unrecognized, can result in severe illness or even death. Therefore, febrile infants often undergo invasive evaluations that include laboratory testing,

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lumbar puncture, and empiric antimicrobial therapy, often in the hospital setting while awaiting the results of bacterial cultures.

In the United States, there are no nationally accepted guidelines for the management of febrile infants. This omission has resulted in significant and unwarranted variation in the management of these infants, which may lead to overtreatment, undertreatment, and suboptimal outcomes for infants.[1,2,4]

Multiple screening methods have been developed to identify infants who have low risk of SBI and do not require hospitalization or empiric antibiotics.[5,6] However, without evidence-based guidance, the management of febrile infants may result in unnecessary hospitalizations and health care overuse in emergency departments,[4,7] inpatient settings,[8] and outpatient settings for low-risk infants.[2] There is also risk of inappropriate underuse and failure to recognize treatable bacterial infections in high-risk infants. The unwarranted variation in care is so great that similar febrile infants seen at 2 different hospitals may receive a minimal outpatient evaluation at one and invasive testing, antibiotics, and hospitalization at the other.[4]

Before 1985, it was recommended that febrile infants be hospitalized and treated with empiric antibiotics pending results of an evaluation for sepsis that most often included cultures of blood, cerebrospinal fluid (CSF), and urine. Predictably, this practice resulted in unnecessary hospitalizations and nosocomial infections.[9] In an effort to improve care, the following decades saw numerous attempts to identify febrile infants who were at low risk for SBI and thus did not require antimicrobial therapy or hospitalization. The first, and arguably most well known, of these classification systems, colloquially termed the Rochester criteria, has been shown to identify febrile infants with a less than 2% chance of SBI.[9,10] Following the publication of the Rochester criteria, other low-risk criteria were published (**Fig. 1**, **Table 1**),[3,5,10–17] most with a similar ability to reliably identify low-risk infants.[5,6]

PREVALENCE/INCIDENCE

Evaluation for fever (defined here as ≥38°C) in well-appearing infants less than 90 days old and without a focal source of infection is common and results in a large number of ambulatory and emergency department visits.[6]

Although all febrile infants are at risk for bacterial infection, SBI is ultimately diagnosed in the minority of these infants and mortality is extremely rare.[1,2,4] Infants

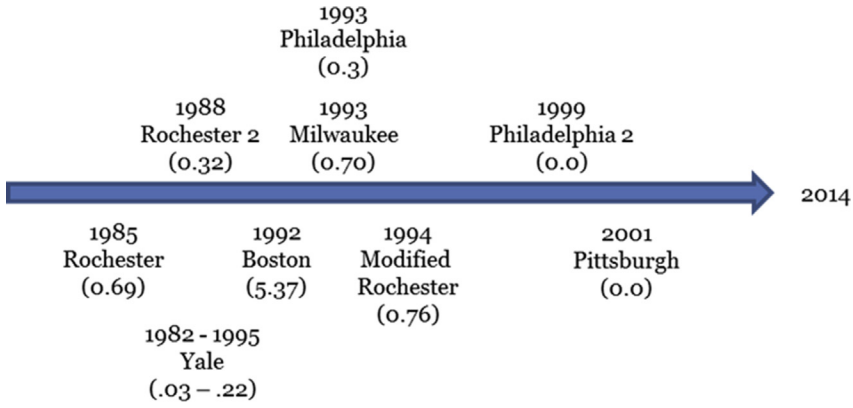

Fig. 1. Timeline showing publication of commonly used low-risk criteria for febrile infants. Values in parentheses represent the risk of SBI in febrile infants meeting the criteria. (*Data from* Refs.[3,5,11–18])