

## **Risk of serious bacterial infection in febrile young infants by general appearance and age**

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Traditional strategies for the evaluation of infants (less than 90 days old) with fever without source (FWS), propose a systematic approach for the identification of patients with low risk for serious bacterial infection (SBI), suitable for outpatient management. Given that these protocols were proposed over 15 years ago, epidemiological change could have affected their performance. Moreover, there is variation among them regarding inclusion criteria as age patient: Boston (28-89 days), Philadelphia (29-60 days), Rochester (younger than 60 days).

**Objective:** To analyse the risk of SBI and invasive bacterial infection (IBI) of young infants by general appearance and age.

**Methods:** Young infants, with FWS, attended in 19 Paediatric Emergency Departments were prospectively included from October 2011 to September 2013. SBI definition: isolation of a bacterial pathogen in blood, cerebrospinal fluid, urine or stools. IBI definition: isolation of a bacterial pathogen in blood or cerebrospinal fluid.

Results: 4,008 infants were evaluated and after exclusion criteria 3,401 (84.8%) were analyzed. An SBI was identified for 784 infants (23%, 704 urinary tract infections), and an IBI for 106 (3.1%, 31 occult bacteremia, 38 urinary infections with bacteremia, 19 sepsis, 17 bacterial meningitis and 1 cervical adenitis with bacteremia). The SBI rate was similar for both well-appearing infants (610/3,035, 20.1%) and for ill-appearing infants (68/367, 18.5%). However, the IBI rate differed: 2.4% and 8.7% respectively ( $p < 0.001$ ), odds ratio (OR) 3.5 (95% CI 2.3-5.4).

The best age cut-off for the identification of high and low risk patients for SBI was 21 days (< 21 days, 27% SBI; > 21 days, 28.7% SBI,  $p = 0.02$ , OR 1.26, 95% CI 1.02-1.44), but for IBI, 30 days (<30 days, 5.5% IBI; > 30 days, 2.15% IBI,  $p < 0.001$ , OR 2.63, 95% CI 1.78-3.87).

For the subgroup of well-appearing infants (3,035), the SBI risk was higher for those younger than 21 days ( $\leq 21$  days, 25.8% SBI; > 21 days, 21.9% SBI,  $p = 0.047$ , OR 1.24, 95% CI 1-1.54), and the risk of IBI was higher for those younger than 15 days old ( $\leq 15$  days, 5.2% IBI; > 15 days, 2.1% IBI,  $p < 0.001$ , OR 2.57, 95% CI 1.49-4.43).

**Conclusion:** For febrile infants, general appearance and age are more useful to distinguish patients at risk for IBI than for SBI. Ill-appearing infants, younger than 3 months with fever without source and those under 15 days of age, even if they are well-appearing infants, are patients at high risk for invasive bacterial infection.