Title: Risk of serious bacterial infection in febrile young infants according to the general appearance and the age

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Background:

Traditional strategies to evaluate young infants (less than 90 days old) with fever without source (FWS) propose a systematic approach for identifying patients at low risk for serious bacterial infection (SBI) suitable for outpatient management. These protocols were proposed more than 15 years ago and epidemiological changes could have modified 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 analyze the risk of SBI and invasive bacterial infection (IBI) among young infants according to their general appearance and the age.

Methods: young infants with FWS attended in 17 Pediatric Emergency Departments were prospectively included since October 2011. 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. Patients attended during the first 10 months are analyzed.

Results: 1,827 infants were evaluated and after exclusion criteria 1,522 (83.3%) were analyzed. An SBI was identified in 310 infants (20.4%) and an IBI in 43 (2.8%). SBI rate was similar in well appearing infants (273/1364, 20.0%) and in not well appearing infants (37/158, 23.4%) but not IBI rate, 2.0% and 10.1% respectively ($p < 0.001$), odds ratio (OR) 0.18 (0.10-0.35; CI 95%). IBI rate was higer in well appearing patients younger than 30 days (3.7%) than 31 to 60 days old (1.1%) and 61 to 89 days old infants (1.4%) ($p < 0.001$). In well appearing infants, the best age cut-off to distinguishing high and low risk patients for SBI was 30 days but for IBI 15 days (Table 1); in well appearing infants with negative urine dipstick was 15 days too (Table 2)

Table 1: 1,364 well-appearing infants

	< 30 days	> 30 days	p	OR (CI 95%)
SBI	24.1%	18.3%	0.017	1.4 (1.1-1.9)
	< 15 days	> 15 days	p	
IBI	5.4%	1.5%	< 0.005	3.7 (1.6-8.4)

Table 2: 1,081 well-appearing infants with negative urine dipstick

IBI	≤ 15 days old	> 15 days old	p	OR (CI 95%)
	3.7%	1.2%	< 0.05	3.3 (1.1-9.6)

Conclusion: Among young febrile infants, the general appearance and the age are more useful to distinguishing patients at risk for IBI than for SBI. Well appearing infants younger than 30 days, and particularly those under 16 days, are at higher risk for IBI than older infants.