

3.7 Platelet Count as test for Invasive Bacterial Infection [10 points]

JAMA Pediatr. 2017;171

Cruz et al did a cross-sectional study to investigate using the platelet count to identify febrile infants < 60 days old with invasive bacterial infections (IBI) and reported these results.

Table 4. Test Characteristics of CBC Parameters for Identifying Infants With Invasive Bacterial Infections

Parameter	Threshold	% (95% CI)				LR+ (95% CI)	LR- (95% CI)
		Sensitivity	Specificity	PV+	PV-		
Platelets, $\times 10^3$ cells/ μ L	<100	7 (2-12)	100 (99-100)	26 (9-42)	98 (97-98)	15.1 (6.6-34.9)	0.9 (0.9-1)
	<150	9 (4-15)	99 (99-99)	16 (6-25)	98 (97-98)	7.9 (4.0-15.7)	0.9 (0.9-1)
	<150 or ≥ 450	31 (22-40)	69 (68-71)	2 (1-3)	98 (97-98)	1.0 (0.8-1.4)	1.1 (1.0-1.2)
	≥ 450	22 (13-30)	71 (69-72)	2 (1-2)	97 (97-98)	0.7 (0.5-1.1)	1.1 (1.0-1.2)
	$\leq 362^a$	61 (51-71)	56 (55-58)	3 (2-4)	98 (98-99)	1.4 (1.2-1.7)	0.7 (0.5-0.9)

Here is the data table that gave rise to the above:

Platelet Count $\times 10^3$ cells/ μ L	IBI+	IBI-	Total
<100	7	16	23
100-<150	2	26	28
150-<450	67	2909	2976
450+	21	1265	1286
	97	4216	4313

- Admittedly some of the numbers are small, but what is the point estimate for the interval likelihood ratio for a platelet count of 100 - < 150 $\times 10^3$? (Show calculation.) [2]
- You are working with a population of patients whose prior probability of IBI you believe is very similar to the prevalence reported in this study. Your current patient is a febrile infant < 60 days old with a platelet count of 125 $\times 10^3$ cells/ μ L. Based on this study and the platelet count, what is your best estimate for the probability of IBI? Explain and show calculations.[2]
- Of the 4 platelet count intervals in the table above, which is the most concerning for IBI? [1]
- What is the LR for a platelet count in that interval?[1]

- e) If your treatment threshold probability for IBI is 1% and the only test you were considering was the platelet count, what pre-test probability would allow you to skip the test and forgo treatment. [2]
- f) In Table 4 from the paper, the authors report an LR of 1.0 for platelets < 150 or ≥ 450 . What is the LR for a platelet count $150 < 450$? [2]