

Implementation of rejection criteria for stool culture: a ballad of loss and gains?

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INTRODUCTION

Stool culture is time consuming and positivity rate in resource-rich settings is low. To gain efficiency and reduce costs, rejection criteria are implemented which allow to reduce the number of fecal samples cultured, without missing clinically relevant enteropathogens.

We retrospectively evaluated the impact of two rejection criteria recommended by guidelines^{1,2}:

(1) rejection of samples from patients hospitalized >3 days (**3DAY**)



(2) rejection of solid stool samples (**SOLID**)



METHODS

We reviewed the results of nonduplicate stool cultures for gastrointestinal pathogens except *Clostridium difficile* performed in 2015 in 7 Belgian secondary care hospitals, the BILULU study group.

3DAY was applied to the results of 7 labs (16476 samples).



SOLID was applied to the results of 6 of 7 labs (14102 samples).



Medical records of a subset of 50 patients with rejected samples for each of both criteria, but positive for a bacterial pathogen, were reviewed for gastrointestinal symptoms and patient management.

RESULTS

	ALL SAMPLES	3DAY	SOLID
Reduction of total number of samples for culture:	0%	32%	20%
Percentage of pathogens missed:	0%	9,7%	8,5%
Gastro-intestinal symptoms	-	38/50 patients	46/50 patients
Treatment with antibiotics	-	9/50 patients	6/50 patients

	Number of samples	Any pathogen	Number of samples with					
			<i>Salmonella</i> spp.	<i>Shigella</i> spp.	<i>Campylobacter</i> spp.	<i>Yersinia</i> spp.	<i>Aeromonas</i> spp.	Other genera
Length of hospital stay								
≤3 days	11233 (68%)	1059 (9,4%)	181 (1,6%)	11 (0,10%)	606 (5,4%)	33 (0,29%)	185 (1,6%)	68 (0,61%)
>3 days (3DAY)	5243 (32%)	110 (2,1%)	13 (0,25%)	1 (0,02%)	34 (0,65%)	9 (0,17%)	40 (0,76%)	20 (0,38%)
All samples	16476	1169 (7,1%)	194 (1,2%)	12 (0,07%)	640 (3,9%)	42 (0,25%)	225 (1,4%)	88 (0,53%)
Consistency								
Solid (SOLID)	2781 (20%)	86 (3,1%)	9 (0,32%)	0 (0%)	43 (1,5%)	6 (0,22%)	10 (0,36%)	19 (0,68%)
Non-solid	11321 (80%)	910 (8,0%)	157 (1,4%)	12 (0,11%)	518 (4,6%)	23 (0,20%)	160 (1,4%)	64 (0,57%)
All samples	14102	996 (7,1%)	166 (1,2%)	12 (0,09%)	561 (4,0%)	29 (0,21%)	170 (1,2%)	83 (0,59%)

CONCLUSION

Implementation of **3DAY** and **SOLID** rejection criteria for stool culture **reduces sample number** with ≥20% but **impairs the yield** of enteropathogens with 9,7% and 8,5% respectively. Using 3DAY, pathogens are missed due to **delayed sampling** in patients lacking manifest symptoms at presentation or logistical issues. Implementing SOLID excludes patients with **intermittent diarrhea**. In the group of missed pathogens, both **established and emerging pathogens** are represented. The clinical relevance is supported by the fact that most patients had **gastrointestinal symptoms**, for which some needed **antibiotic treatment**.

¹ Clinical Microbiology Procedures Handbook, 4th Ed. 2016, Leber AL (Eds.), volume 1, ASM Press Washington DC.

² Humphries RM, Linscott AJ. Laboratory diagnosis of bacterial gastroenteritis. Clin Microbiol Rev. 2015 Jan;28(1):3-31.