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

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Background: 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) rejection of samples from patients hospitalized >3 days (3DAY) and (2) rejection of solid stool samples (SOLID).

Material/methods: Results of nonduplicate stool cultures performed in 2015 in 7 secondary care hospitals in (Flanders) Belgium, were reviewed. 3DAY was applied to the results of 7 labs (16476 samples), SOLID to the results of 6 of 7 labs (14102 samples). Medical records of a subset of 100 patients with rejected samples (50 3DAY and 50 SOLID), but positive for a bacterial pathogen were reviewed for gastrointestinal symptoms and patient management.

Results: Using 3DAY and SOLID rejection criteria the total number of samples for culture was reduced with respectively 32% and 20%. A bacterial pathogen was recovered from 1169/16476 stool samples (7,1%), with 204 pathogens (1,2%) isolated from samples that should have been rejected: 117 enteric pathogens were obtained from 110 3DAY fecal samples, 87 were retrieved from 86 SOLID samples (Table 1). Review of the medical records revealed that gastro-intestinal symptoms were present in 84/100 patients, 13% were treated with antibiotics based on the culture result.

Conclusions: Implementation of 3DAY and SOLID rejection criteria for stool culture reduces sample number with >20% but impairs the yield of enteropathogens with respectively 9,4% and 8,6%. Using 3DAY, pathogens are missed due 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.

Table 1. Pathogen distribution in different sample groups.

		Number of samples with						
	Number of samples (%)	**Any pathogen (%)**	***Salmonella* spp.**	***Shigella* spp.**	***Campylobacter* spp.**	***Yersinia* spp.**	***Aeromonas* 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	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	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%)

Other genera include Shiga-toxin producing *Escherichia coli*, *Vibrio* spp, *Plesiomonas* spp, *Helicobacter pullorum*, *Arcobacter* spp, *Hafnia alvei*, *Providencia alcalifaciens*