Gastrointestinal (GI) PCR vs Stool Cultures: Impact on Length of Hospital Stay (LOS) and Antibiotic Use

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BACKGROUND

- GI PCR can detect 22 pathogens (bacteria, parasites and viruses) from a single stool sample
- Stool cultures are labor intensive and only target the most common diarrheal pathogens (such as *Campylobacter*, *E. coli* and a few parasites)
- We hypothesized that implementation of GI PCR would result in decreased LOS and lower antibiotic use

METHODS

- This was a retrospective study and data was collected from review of electronic medical records
- Inclusion criteria: Patients aged > 18 years old who were admitted with diarrhea over a 3-year period from 2016 to 2019
- LOS and antibiotic use data was collected for patients who had GI PCR from 2017–2019 (GIP arm) and compared with data from patients who had stool cultures from 2016–2017 (SC arm)
- Differences were assessed using Chi-square or Fisher's exact test for categorical variables and the Mann Whitney Rank Sum test for continuous variables

OBJECTIVES

- To assess the impact of implementation of GI PCR on LOS and antibiotic use

TABLE 1: GI PCR vs Stool Cx

	GIP arm N=225		SC arm N=113	
RESULT	**No. of patients, n**	**Percentage, %**	**No. of patients, n**	**Percentage, %**
Positive	59	26.22%	11	9.73%
Negative	153	68.0%	102	90.27%
Indeterminate	13	5.78%	0	NA

TABLE 2: Most Frequently Isolated Organisms

GIP arm		SC arm	
Most frequently detected organisms	% (n/N)	Most frequently detected organisms	% (n/N)
Enteropathogenic E. Coli	9.3% (21/225)	Campylobacter	6.19% (7/113)
Norovirus	4.9% (11/225)	Salmonella	0.88% (1/113)
Enteroaggregative E. coli	4.4% (10/225)	Adenovirus	0.88% (1/113)
		Other	1.76% (1/113)

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RESULTS

- Total N = 338 patients
- N in GI PCR arm = 225 (66.6%); N in SC arm =113 (33.4%)

In GI PCR arm (vs SC arm):

- Positive result more common (26.2% vs 9.7%, *P* <.0001; **Table 1**)
- Median LOS = 6 days (IQR: 4–13) vs 5 days (IQR: 3–7) (*P*=.060)
- No difference found in antibiotic use (84.9% vs 84.1%, P=.844)

Within the GI PCR arm:

- Shorter median LOS for patients detected with viruses vs those with non-viral pathogens 3.5 days (IQR: 3-7) vs 6 days (3-12)
- Lower antibiotic use among patients detected with viruses vs those detected with non-viral pathogens (73.1% vs 81.8%)
- 8 patients with LOS of 75 days due to comorbidities and disposition issues

CONCLUSIONS

- LOS was longer in patients in GIP arm vs SC arm, which may have been influenced by the presence of outliers in the GIP arm. No differences in antibiotic use was observed between the two groups. However, within the GIP arm, detection of viruses by GI PCR significantly shortened LOS and lowered antibiotic use.