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Background: Infective diarrhea is a common problem. Multiplex Polymerase chain reaction (PCR) based pathogen diagnostics of diarrheal stool specimens are shown to be highly sensitive and rapid as opposed to conventional diagnostics.

Methods: We analyzed the performance of a multiplex PCR test, FilmArray (FA) gastrointestinal (GI) panel, on stool specimens in patients admitted with acute and chronic diarrhea to our hospital from December 2016 to December 2019 and compared the results with conventional diagnostic tests.

Results: A total of 98 patients were analyzed, 52 were males and 9 belonged to pediatric age. 92.9% patients presented with acute diarrhea. None were HIV positive. Among 98 tested, FA GI pathogen panel was positive for at least one pathogen in 39.8% patients. The yield was low for stool culture, 7.79%. In samples tested by FA GI pathogen panel, a single pathogen was identified in 27 patients (27.5%) while multiple targets were identified in 12 patients (12.2%). Majority (76.5%) had normal stool routine. Stool routine abnormality and positive GI pathogen panel did not correlate, as only 7 patients with abnormal stool routine had a positive result in FA GI pathogen panel, while 12 patients had negative result. Among the 39 patients with positive FA GI pathogen panel, only 6 had positive stool culture result. All stool culture positive sample also had GI pathogen panel positive result. Commonest organism in stool culture was Salmonella (5) while one patient had E. coli. Commonest organism in stool FA GI pathogen panel was also Salmonella, 12 isolates as a single pathogen and 5 as one among the multiple targets identified, making a total of 17 isolates. This is followed by Enteroaggregative E. coli (EAEC- 9) and Enteropathogenic E. coli (EPEC- 5). %). Only one had virus as pathogen (norovirus), no parasitic infection was identified. Multiple pathogens were identified in 12 patients. Clostridium difficile toxin was positive in 2 in whom multiple targets were identified. Among the chronic diarrhea syndrome, none had stool culture positivity while two had positive FA GI pathogen panel results and the organisms were Campylobacter and EAEC.

FA GI pathogen panel results

Table 1: Pathogens in FA GI pathogen panel

FA GI pathogen panel results	Frequency	As part of multiple organisms	Total frequency, (%)
EPEC	3	2	5 (12.8%)
ETEC (Enterotoxigenic *E. coli*)	1	2	3 (7.7%)
EAEC	5	4	9 (23%)
Salmonella	12	5	17 (43.5%)
Campylobacter	0	3	3 (7.7%)
Norovirus	2	1	3 (7.7%)
STEC E coli	1	0	1
EIEC	0	1	1
Shigella/ EIEC	2	0	2
Plesiomonas shigelloids	1	0	1
Clostridium difficile toxin A and B	0	2	2
More than one organism	12		
Total	39		

Multiple targets that are identified

Table 2: Details of multiple organisms identified in a sample by FA GI pathogen panel

1	*Salmonella*, EPEC
2	EAEC, cryptosporidium
3	*Campylobacter*, EAEC
4	EAEC, EPEC, ETEC
5	EIEC, norovirus, *Campylobacter*
6	*Campylobacter*, EPEC, ETEC
7	*Clostridium difficile* toxin A and B, EAEC
8	*Clostridium difficile* toxin A and B + salmonella
9	EAEC, EPEC
10	*Salmonella*, EPEC
11	*Salmonella,* EAEC
12	*Salmonella* +EAEC

Conclusion: FA GI panel detects a wide array of GI pathogens, better yield and has a quick turn-around-time compared to conventional tests like stool culture.

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721. Effect of Gastrointestinal Pathogen Panel (GIP) in Antibiotic Management

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Background: GIP offers detection via PCR for a wide array of common microbes associated with diarrheal illness. Its rapid turnaround time and high sensitivity has made GIP testing commonplace for the evaluation of diarrhea. The purpose of this study is to determine if GIP influences antibiotic management in patients hospitalized with diarrhea.

Methods: Fifty patients hospitalized at Mayo Clinic Arizona between July and December 2019 who underwent BioFire® FilmArray™ GI PCR Panel testing were randomly selected. Medical records were reviewed to capture gender, age, immunocompromised state, antibiotic use within 30 days, prior hospitalization within 3 months, history of *Clostridioides difficile* infection, time from admission to testing and GIP results, and to determine if GIP results directly contributed towards antibiotic management. This study was exempt from Institutional Review Board approval.

Results: Twenty-six patients were male and twenty-four were female. The average age was 61.7 years. Thirty-four patients (68%) were immunocompromised. Forty-one GIPs were ordered within 24 hours of admission. Twenty-two patients (44%) had a positive GIP result; five were positive for 2 concurrent organisms. *C. difficile* was the most commonly detected organism, found in 16/24 (66.7%) positive tests. Eleven patients (68.8%) with *C. difficile* had a recent hospitalization, antibiotics within 30 days, or a history of *C. difficile* infection. There were 3 cases of *Enteropathogenic Escherichia coli*, 2 of *Enterotoxigenic Escherichia coli*, 2 of adenovirus, 2 of norovirus, 1 of rotavirus, and 1 of *Vibrio cholerae*. Excluding *C. difficile* positive patients, GIP testing contributed in changing antibiotic management in 3/50 (6%) patients tested. One patient had antibiotics stopped, one received correct antibiotics, and one received inappropriate antimicrobial therapy.

Conclusion: These results suggest that except in the setting of *C. difficile* infection, GIP has little utility in guiding antimicrobial management, even in the immunocompromised patient. GIP testing is expensive and it may be more resourceful to screen patients hospitalized with diarrhea for *C. difficile* alone, especially in those with risk factors for *C. difficile* infection. Furthermore, GIP testing can lead to antibiotic overuse.

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722. Effectiveness of Fidaxomicin versus Oral Vancomycin in the Treatment of Recurrent *Clostridioides difficile*

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Background: The 2017 IDSA/SHEA clinical practice guidelines for *Clostridioides difficile* infection (CDI) recommend treating recurrent episodes with fidaxomicin or oral vancomycin, but there is little evidence to support one strategy over another, particularly beyond the first recurrence. The aim of this study was to compare clinical outcomes in patients with recurrent CDI treated with vancomycin vs. fidaxomicin.

Methods: This was a retrospective study evaluating inpatients with recurrent CDI treated with vancomycin or fidaxomicin between January 1, 2013 and May 1, 2019. The primary outcome was CDI recurrence. Secondary outcomes included re-infection, treatment failure, infection-related length of stay (IRLOS), and in-hospital all-cause mortality (IHACM). Data collected included demographics; number of previous CDI episodes; CDI therapy; time to recurrence and re-infection; exposure to broad-spectrum antibiotics, proton pump inhibitors, and probiotics. Wilcoxon rank sum, Pearson chi-square, or Fisher's exact tests were utilized, as appropriate. A multivariable logistic regression (MLR) model was used to estimate the adjusted odds ratio and 95% confidence interval assessing recurrence while adjusting for confounding variables. A survival analysis was also conducted.

Results: One hundred thirty-five patients met inclusion criteria (n = 35 fidaxomicin vs. n = 100 vancomycin). Of these, 42 (31%) had experienced at least 2 CDI episodes prior to their index recurrence. There was no difference in CDI recurrence [7 (20%) fidaxomicin vs. 11 (11%) vancomycin, p=0.18]; this persisted in the MLR model (OR 0.85 [95% CI 0.27-2.7]) and survival analysis (P = 0.1954). Additionally, there was no difference in re-infection rate (p=0.73), treatment failure (p=0.13), IRLOS (p=0.19), or IHACM (p=0.65).

Conclusion: Oral vancomycin and fidaxomicin are both suitable treatment options in the setting of recurrent CDI.

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723. Epidemiology, Risk Factors, and Treatment Considerations for Pyogenic Liver Abscess (PLA) in the Calgary Health Zone (CHZ) Revisited: A Population-Based Study

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Background: PLA is a significant cause of morbidity and mortality. However, its epidemiology and outcomes have not been recently evaluated in the CHZ. Understanding current trends will help guide management.

Methods: In this population-based study, we evaluated epidemiology, risk factors, and treatment of patients with PLA in the CHZ. CHZ residents aged ≥ 20 years diagnosed with PLA in 2015-2017 were included. Charts were reviewed for demographics and clinical outcomes. Multivariate logistic regression was used to determine factors associated with 30-day mortality. Findings were compared to a previous assessment of PLA in the CHZ from 1999-2003 (Kaplan et al., 2004).

Results: A total of 136 patients with PLA were identified, representing an annual incidence rate of 3.7 cases per 100,000 population. Compared to 1999-2003, incidence of PLA was increased (2.3 per 100,000; p< 0.01) but mortality was similar (1999-2003: 0.22 per 100,000 vs. 2015-2017: 0.26 per 100,000; p=0.6). The most common culprit organisms were *Streptococcus anginosus* group (40%), *Klebsiella* species (25%), *Escherichia coli* (18%), and obligate anaerobes (16%). Pathogen prevalence was similar to the prior cohort. Compared to 1999-2003, antibiotic resistant organisms were more frequent (8% vs 1%, p=0.04). In our cohort, liver aspirations were less frequent (p=0.02) but aspirate culture was more often positive (p< 0.01). The median duration of intravenous antibiotic therapy was longer compared to previous (2015-2017: 23 days (IQR 9-38) vs. 1999-2003: 17 days (IQR 10-29); p=0.001). Similarly, the total duration of antibiotic therapy was longer (2015-2017: 42 days (IQR 25-65) vs. 1999-2003: 31 days (IQR 18-45); p< 0.001). Thirty-day mortality from admission was 7% and did not differ amongst cohorts. Risk factors are shown in Table-1.

Table-1: Risk factors for 30-day mortality in PLA

Table-1: Risk factors for 30-day mortality in PLA

Factors associated with 30-day mortality	Multivariate (OR, p-value)
Polymicrobial bacteremia	18.5, 0.014
No drainage performed	13.3, 0.045
History of congestive heart failure	35.7, 0.031
History of liver disease	10.3, 0.059
Total bilirubin	1.0 per umol/L, 0.023

Conclusion: Incidence of PLA in the CHZ is rising with more antimicrobial resistance. Diagnostic liver aspirations are less frequent. Antibiotic durations are longer with no reduction in mortality. Understanding changing trends is valuable in directing future care. Encouraging liver aspirations to obtain a microbiologic diagnosis, especially with increasing resistance, is crucial. Considering shorter antibiotic durations in light of stable mortality warrants further exploration.

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724. 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 retrospective study utilized data from review of electronic medical records and included 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.

Results: The analysis included a total of 338 patients, 225 (66.6%) in the GI PCR arm and 113 (33.4%) in the SC arm. A significantly higher proportion of patients in the GIP arm had a positive result compared with the SC arm (26.2% vs. 9.7%, $P < .0001$; **Table 1**). **Table 2** shows the most frequently isolated organisms. Median LOS was 6 days (IQR: 4–13) for the GIP arm and 5 days (IQR: 3–7) for the SC arm (p=.060); 8 patients in the GIP arm had average LOS of 75 days due to comorbidities and disposition issues. However, within the GIP arm, median LOS was much shorter for patients detected with viruses by PCR vs. those with non-viral pathogens (3.5 days (IQR: 3-7) vs. 6 days (3-12)) There was no difference in antibiotic use between the GIP and SC arms (84.9% vs. 84.1%, P=.844). Patients in GIP arm were more commonly given Piperacillin-tazobactam and Carbapenems, whereas patients in the SC arm received metronidazole more often. Within the GIP arm, antibiotic use was lower among patients detected with viruses vs. those detected with non-viral pathogens (73.1% vs. 81.8%).

Table 1

	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

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)

Conclusion: 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.

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725. Influence of An Emerging Pathogen, *Streptococcus anginosus,* on Clinical Outcomes in Pediatric Appendiceal Abscess

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Background: Escherichia Coli is the most common primary pathogen in appendiceal abscess, but an increasing number involve Streptococcus anginosus (SA) as the primary isolate. Ten years of data from a regional medical center was reviewed to track changes in the microbiology and outcomes of this condition. We believe that SA is emerging as a significant pathogen in appendiceal abscess in children and it is associated with increased morbidity compared to more commonly encountered pathogens.

Methods: A medical records search was done (IRB#5194) for patients below age 18 from 1/2008 to 12/2017 with acute appendicitis with local/generalized peritonitis