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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

or peritoneal abscess. There were 557 records retrieved, of which 201 had appendiceal abscess. The records were further divided based on the type of operation and timing of abscess development. There were 104 laparoscopic, 34 open, 4 drain alone, 53 interval management with a drain, and 6 interval without a drain. The focus of the study is laparoscopic and open post operative abscess. 56 of the laparoscopic cases developed a postoperative abscess of whom 45 had culture and sensitivity data. 25 of the open cases developed a postoperative abscess of whom 24 had culture and sensitivity data.

Results: Of the 45 postoperative abscesses following laparoscopic procedure, the most common isolate was E. coli (34) followed by SA (13). Of the 24 postoperative abscesses following open procedure, the most common isolate was also E. Coli (17) followed by SA (6). Patients are divided into those who had any culture of SA (SA group), vs those who did not (non-SA group). For laparoscopic cases there was no difference between additional procedures needed. However for open procedures, the SA group had an average of 2.33 additional procedures needed compared to the 0.94 additional procedures for the non-SA group (p=0.024). Major adverse outcomes included one death from sepsis, abdominal compartment syndrome, and one patient needing bilateral salpingectomy, all in the SA group.

Conclusion: SA has emerged as an important and virulent pathogen in complex appendicitis in pediatric patients. It is sensitive to commonly used antibiotics, but is associated with increased risks of reoperation, additional drainage and adverse outcome for the sicker patients who require an open procedure.

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726. Investigation of Epidemiological Characteristics and Outcomes in Enteropathogenic Escherichia coli positive patients

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Background: New generation multiplex polymerase chain reaction (PCR) panels have led to the ability of rapid detection of Enteropathogenic *Escherichia coli* (EPEC). Although many studies have looked at the pathogenesis of this organism in the pediatric populations, fewer studies include adults. We aimed to determine if EPEC is pathogenic on its own, or has a predilection for certain populations based upon risk factors. This was achieved by comparing risk factors in patients positive for EPEC on the BioFire Gastrointestinal (GI) Pathogen Panel versus patients negative for all targets on the panel.

Methods: This is a single center case control study that was performed using a retrospective chart review from January 1, 2016 thru August 31, 2019. All patients were symptomatic with diarrheal illness and had a GI pathogen panel performed. The study group were patients that were EPEC positive. The control group were patients with a negative PCR panel that were matched three to one based upon age and gender. Chi-squared statistical analysis was used.

Results: 792 patients were evaluated. In the adult group the EPEC positive actual length of stay (LOS) was 13.5 rather than 9.3 in the control. Although this was not statically significant this trended towards a longer LOS as seen in Table 1. In the pediatric population, both expected and actual LOS were statically longer viewed in Table 2. This may be due to these patients being more chronically ill at baseline, with a greater number of pediatric coronary artery disease and ulcerative colitis in the control. Males were more likely to test positive for EPEC at 69.86% in the pediatric population than in the adult population with statistical significance at p=0.0035. The pediatric population had more co-infections with EPEC at 57.53% with p< 0.0001. This can be further seen in Table 3.

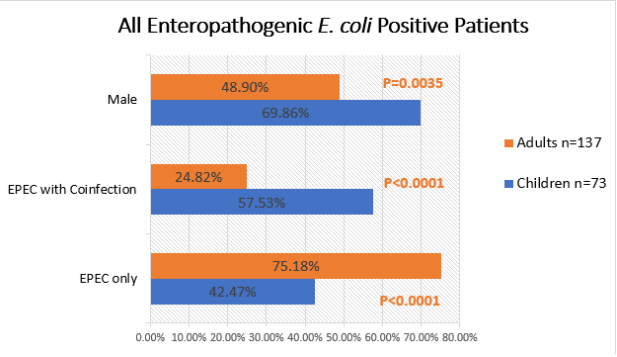
Table 1

Adults Data Ages 18 year and older			
Total Adult N=539	Enteropathogenic *E. coli* (EPEC) positive patients N=137	Control N=402	P value
Average Age	54.81	54.82	0.9992
Gender (%)			
Female	51.10	51.24	0.9761
Male	48.90	48.76	0.9761
% Co infection	24.82	N/A	
Past medical History all in (%)			
Coronary Artery Disease	34.81	43.14	0.0719
Diabetes Mellitus	36.57	46.52	0.0285
Chronic Kidney Disease	38. 51	41.04	0.5222
Percent on hemodialysis	8.76	11.69	0.3421
Autoimmune Disease	32.58	19.40	0.0029
HIV diagnosis	6.67	3.98	0.4413
S/P Transplant	13.33	16.17	0.3953
Underlying diagnosis of chronic diarrhea (sub groups below)	61.31	62.19	0.8572
Irritable bowel disease	7.30	10.45	0.2801
Crohns	6.57	9.95	0.2340
Ulcerative colitis	8.09	13.68	0.0819
Celiac disease	0	0.50	0.4065
Lactulose intolerance	0	1.24	0.1902
Chronic Pancreatitis	3.649	5.97	0.2983
Unspecified chronic diarrhea	59.12	57.96	0.8103
Duration of stay (days)			
Actual length of stay	13.489	9.269	0.1373
Expected length of stay	5.519	5.18	0.5400

Table 2

Children Data Less than 18 years of age			
Total Children N=253	Enteropathogenic *E. coli* (EPEC) positive patients N=73	Control N=180	P value(s)
Average Age	4.89	6.17	0.1320
Gender (%)			
Female	30.14	32.78	0.6818
Male	69.86	67.22	0.6818
% Co infection	57.53	N/A	
Past medical History all in (%)			
Pediatric coronary artery disease	0	6.66	0.0238
Diabetes Mellitus	4.11	4.44	0.9045
Chronic Kidney Disease	6.95	9.44	0.5093
Percent on hemodialysis	4.11	5.00	0.7642
Autoimmune Disease	13.81	14.20	0.4295
HIV diagnosis	1.37	1.66	0.8650
S/P Transplant	9.59	16.38	0.1170
Underlying diagnosis of chronic diarrhea (sub groups below)	45.20	45.00	0.9761
Irritable bowel disease	2.74	3.33	0.8103
Crohns	10.96	3.33	0.5093
Ulcerative colitis	0	5.55	0.0404
Celiac disease	4.11	1.11	0.1211
Lactulose intolerance	8.22	4.44	0.2340
Chronic Pancreatitis	2.74	2.77	0.9840
Unspecified chronic diarrhea	39.73	40.56	0.9045
Duration of stay (days)			
Actual length of stay	12.66	25.75	0.0001
Expected length of stay	4.70	11.88	0.00804

Table 3



Conclusion: In the adult EPEC positive patients there was no statistically significant difference in length of stay in comparison to negative control. This raises the question to if this is truly a pathogen in adults. In the pediatric population, our control group was likely more ill, which made it difficult interpret the significance of differences in LOS.

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727. Outcomes of Antibiotic Use in Ischemic Colitis

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Background: Ischemic colitis (IC) is caused by inadequate blood flow to the colon. Most cases resolve with conservative management. Isolated right-sided colitis, peritonitis, shock, and vascular risk factors are predictors of severe disease which can be life-threatening and require surgery. Current guidelines recommend antibiotics for moderate/severe disease. This is based on results from animal models and concern for gut translocation of bacteria; there have been no comparative studies in humans. This study aims to evaluate whether there is benefit to antibiotic use in non-severe IC.

Methods: This is a single-center retrospective cohort study of adult patients hospitalized with IC from 2015-2018. Inclusion in the study required endoscopic, radiologic, operative, or histologic evidence of ischemic colitis. Patients were divided into mild/moderate and severe IC cohorts as per 2014 American College of Gastroenterology Guidelines. Primary outcomes were length of stay (LOS) and any adverse event, which is defined as a composite measure of pre-specified secondary outcomes including mortality, need for surgery, 1-year relapse, and bacteremia.

Results: Of 191 patients enrolled in the study, 130 had mild/moderate IC and 61 had severe IC. In mild/moderate IC groups there was no significant difference in total adverse events, although use of antibiotics was associated with a significant increase in LOS (Table 1). In the severe IC groups there was no significant difference in any