Clinical management changes after positive multiplex gastrointestinal pathogen panel testing for evaluation of diarrhea

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Background

- IDSA guidelines for diarrhea include pathogen-specific management
- Compared to non-molecular tests, multiplex gastrointestinal pathogen panels (GIPPs) may allow for more timely and cost-effective diagnoses and care.
- Main objective: to determine the impact of positive GIPP results on clinical management, including antimicrobial use.

Methods

- Retrospective observational study of individuals with
  - Diarrhea
  - A positive GIPP (xTAG Gastrointestinal Pathogen Panel, Luminex) processed at the McLendon lab of UNC Medical Center between January 2018 and December 2018
- Excluded: immunocompromised patients (solid organ or stem cell transplant, HIV with CD4 count < 200, primary immunodeficiency, immunosuppressive medications including biologics, on prednisone equivalent 20mg/day >14 days)
- Primary outcome of interest: change in antimicrobial usage

Results

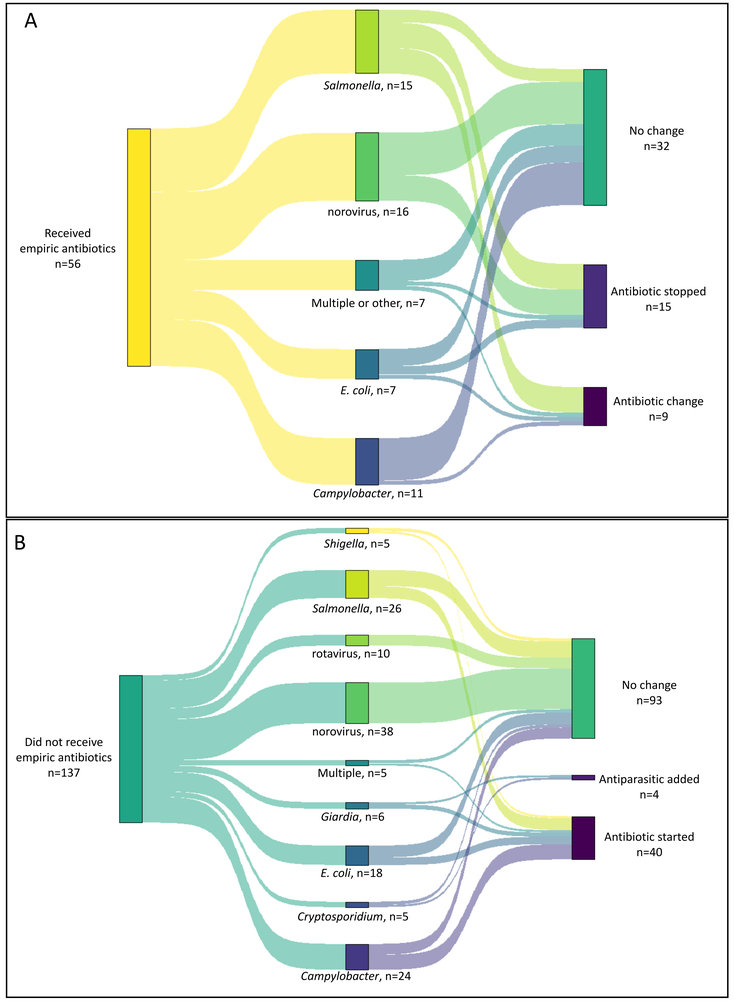
- In 2018, 2,333 GIPP tests were performed; 266 (11.4%) were positive
  - 193 met inclusion criteria

Table 1. Demographic characteristics and clinical presentation of study population

Patient Characteristics	
Male gender – n (%)	106 (55)
Age (years), median (IQR)	31 (5-56)
Age group (years) – n (%)	
0-5.9	51 (26)
6-17.9	15 (8)
18-49.9	67 (35)
≥50	60 (31)
Clinical Presentation at time of test – n (%)	
Vomiting	82 (43)
Abdominal pain/cramping	95 (49)
Abdominal tenderness	54 (28)
Diarrhea	193 (100)
Bloody diarrhea	50 (26)
Watery diarrhea	151 (78)
Gastrointestinal Pathogen Testing	
Testing site	
ED	65 (34)
Outpatient clinic	73 (38)
Inpatient ward – floor or stepdown	53 (28)
Inpatient ward - ICU	2 (1)
Time from collection to result (hours), median (IQR)	30.5 (24.0-52.9)

Results

Figure 1. Sankey diagrams demonstrating impact of GIPP result on antimicrobial use by pathogen detected in those who received empiric antibiotic treatment **(A)** prior to test result and **(B)** those who did not receive empiric antibiotics.



"*E. coli*" includes Shiga-toxin producing *E. coli*, enterotoxigenic *E. coli*, and *E. coli* O157:H7.

Table 2. Proportion of participants with positive GIPP testing by pathogen detected.

Organism	n (%)
Campylobacter	38 (20)
Salmonella	46 (24)
Shigella	10 (5)
E.coli 0157	3 (2)
Enterotoxigenic *E.coli*	16 (8)
Shiga-toxin producing *E.coli*	11 (6)
Giardia	9 (5)
Cryptosporidium	6 (3)
Rotavirus	12 (6)
Norovirus	56 (29)

* Some individual's GIPP results were positive for more than 1 pathogen

Table 3. Types of clinical management changes among participants in whom a management change occurred

How did GIPP result change management	n (%)
Individuals who experienced a change (some with >1 change)	83 (43)
Antibiotic discontinued	15 (8)
Antibiotic changed	9 (5)
Antibiotic treatment started	40 (21)
Isolation precaution changed	6 (3)
Other procedure or testing performed	3 (2)
Other procedure or testing avoided	6 (3)
Antiparasitic treatment started	4 (2)
Other	10 (5)

Conclusions

- Positive GIPP results can prompt changes in antimicrobial treatment in some non-immunocompromised patients with diarrhea.
  - Changes happened more frequently among individuals started empirically on antibiotic therapy
- Future efforts will evaluate the appropriateness of these management changes

References

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