REDUCING RATES OF HOSPITAL-ACQUIRED CLOSTRIDIOIDES DIFFICILE INFECTION BY SWITCHING TO TWO-STEP TESTING

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INTRODUCTION

- *Clostridioides difficile* infection (CDI) tests have various degrees of sensitivity, making diagnosis challenging
- Polymerase chain reaction (PCR) positive tests in colonized patients can impact rates of hospital-acquired CDI (HACDI).
- A negative toxin A/B enzyme immunoassay (EIA) as a second step can help determine colonization but is not as sensitive. We aimed to study the impact of a two-step testing strategy on rates of HACDI and CDI treatment outcomes.

METHODS

- Two-step testing consisted of *C. difficile* DNA PCR, which if positive, was followed by toxin A/B EIA (Figure 1).
- A retrospective study in a 359-bed hospital 3/2020-7/2021
- Patients with positive PCR and negative EIA results were included and further classified based on CDI treatment status
- Primary outcome: The number of HACDI cases avoided.
- Secondary outcomes: location at the time of testing, symptoms, leukocytosis, discharge disposition and readmission

RESULTS

- Ninety-six patients were included. Sixty-five patients (68%) were treated while 31 (32%) were not.
- HACDI was avoided in 18 cases (18.8%)
- There were more HACDI avoided in the non-treated group compared to the treated group (32.3% vs 12.3%; p=0.026) (Table 1).

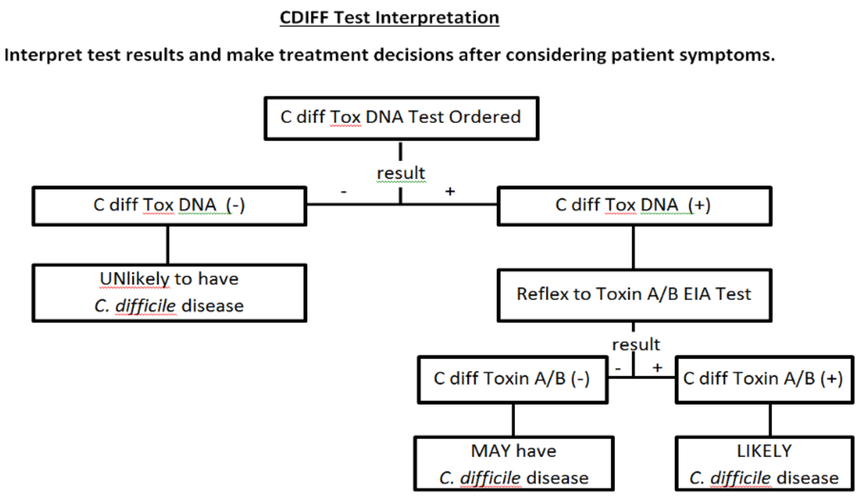

Figure 1. Schematic of *C. difficile* test interpretation.

- Most non-treated patients were tested on medical-surgical units (77.4%), whereas 49.2 % of the treated patients were tested in more acute areas such as emergency or intensive care.
- Treated patients were more likely to have leukocytosis and/or fever (66.2%) compared to non-treated patients (29%; p= 0.0009), while there was no difference in abdominal pain, diarrhea, bloody stool, or constipation (Table 2).
- Most patients had an abdominal CT scan (70.8%). Of those that had a CT, colitis was found in 48.5%. Patients in the treated group were more likely to have had a CT completed that showed colitis vs the non-treated patients (43.1% vs 16.1%; p<0.011).
- Finally, compared to the non-treated patients, treatment did not affect home disposition on discharge or 30-day readmission rate (80% vs 71%, P=0.436) and (25 % vs 29%, P= 0.63) respectively.

Total N=96	Treated N=65	Not Treated N=31	P-value
18 (18.8%)	8 (12.3%)	10 (32.3%)	0.026

Table 1. Hospital acquired *Clostridioides difficile* infections avoided.

	Total N=96	Treated N=65	Untreated N=31	P-value
Leukocytosis alone	29	23 (35.4%)	6 (19.4%)	0.154
Abdominal pain	34 (35.4%)	26 (40%)	8 (25.8%)	0.254
Diarrhea	86 (89.6%)	58 (89.2%)	28 (90.3%)	1
Bloody stool	5 (5.2%)	3 (4.6%)	2 (6.5%)	0.657

Table 2. Symptoms on presentation.

DISCUSSION

- EIAs provide good specificity, but sensitivity is generally not enough to rule CDI out.
- A positive EIA for a toxin does not differentiate whether the individual is an asymptomatic carrier who happens to have similar symptoms on presentation or has been cured
- Nucleic acid amplification tests (NAATs) are very sensitive in detecting *C. difficile* even in patients who are colonized with no toxin production, leading to overdiagnosis
- It is for this reason that many institutions are now implementing a two-step testing protocol such as the one described in our investigation

CONCLUSION

- CDI two-step testing led to decreased HACDI rates without affecting discharge disposition or readmission rates in patients with PCR positive and toxin EIA negative results regardless of treatment status.

REFERENCES

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