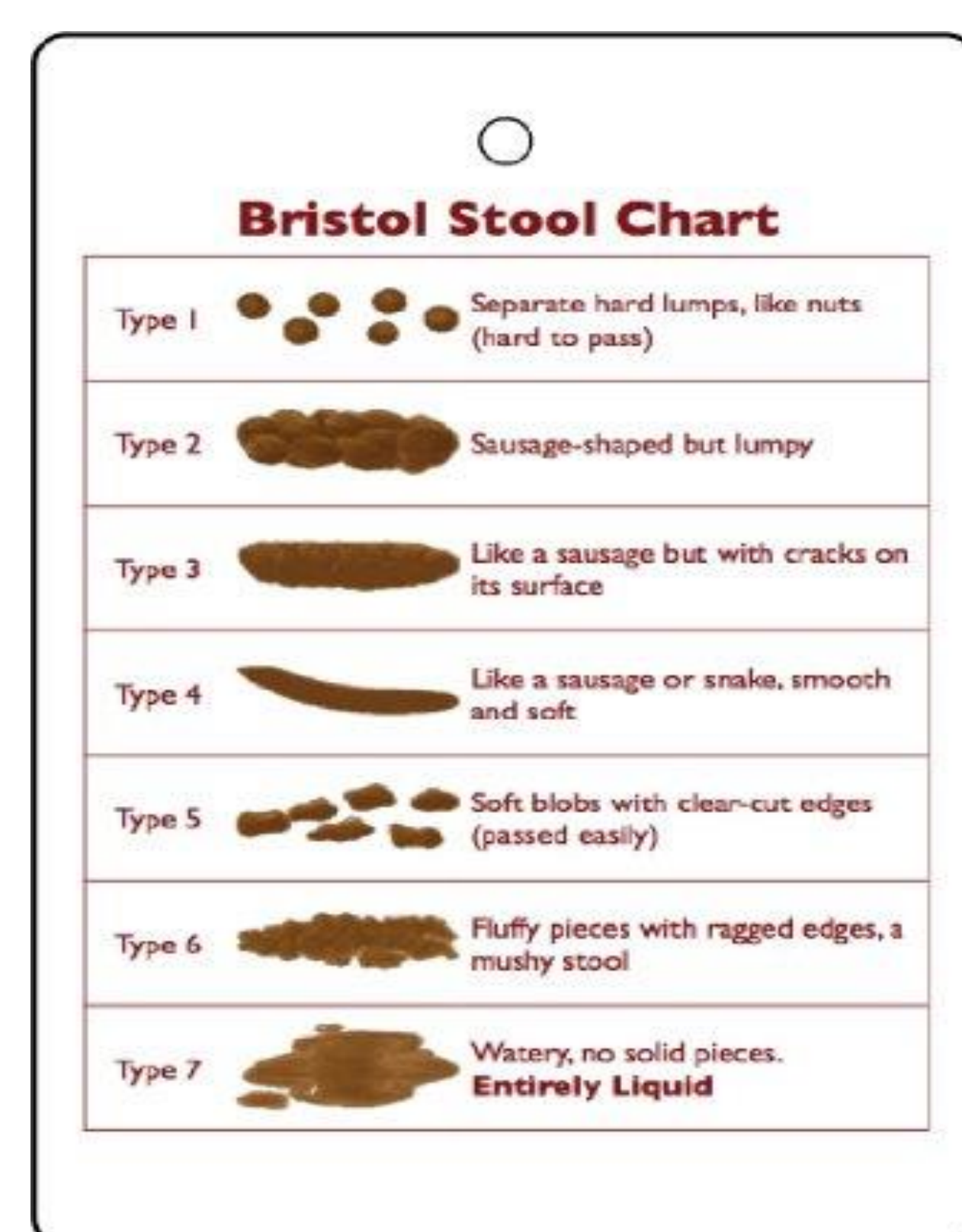
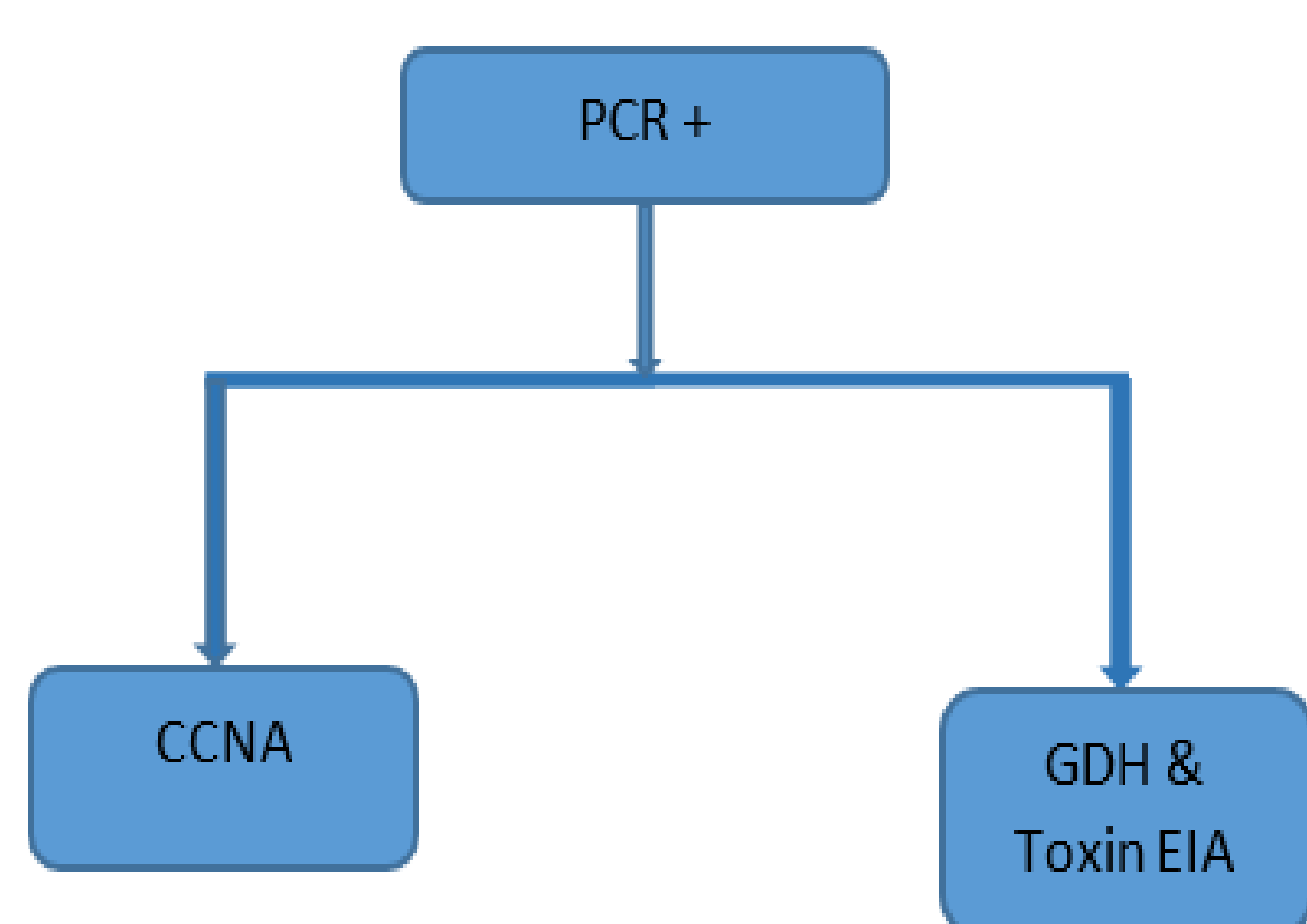


BACKGROUND

Diagnosis of *Clostridium Difficile* infection (CDI) is challenging. The reason is two-fold- a) lack of unique symptoms and b) there is no gold standard test for CDI. We studied variation in CDI rates when different diagnostic algorithms were utilized. In addition, we compared patients who met the clinical definition of CDI in each group.

METHODS

This is a retrospective study at an academic medical center (401-bed) conducted over 12 months (January 2017- December 2017). A total of 574 stool samples were sent for CDI testing. We utilized the Bristol Stool Chart (BSC) for defining criteria for accepting the stool sample. Only type 7 (on BSC) was accepted for CDI testing. Of the 574, approximately 14% (n=81), were positive by polymerase chain reaction (PCR) for *C. Difficile*. PCR positive specimens were then tested for Glutamate Dehydrogenase (GDH) and Toxin Enzyme Immunoassay (EIA). Additionally, all PCR positive cases were also tested for toxin production by cytotoxic neutralization assay (CCNA). All diagnostic tests for CDI were done in house except CCNA. Clinical *C.Difficile* was defined as 3 or more loose stools within a 24 hour time period. This definition was applied to both community-onset and hospital-onset CDI cases. Patient data was obtained from review of electronic health records.



RESULTS

Characterization of PCR+ Cases (N=81)

	GDH+	Toxin EIA+	CCNA+
% of Positive results	60% (n=49)	30% (n=25)	66% (n=54)
% Met clinical definition	23.4% (n=19)	14.8% (n=12)	30.86% (n=25)

CDI Rate with Different Diagnostic Algorithms

Diagnostic algorithms	CDI Rate (per 10,000 patient days)
PCR+	10.2
PCR+ → GDH+ or/& Toxin EIA+	3.02
PCR+ → CCNA+	6.81

Duration of Symptoms in PCR+ Cases

	GDH+	Toxin EIA+ or/& CCNA+	P-value
Subjects with prolonged symptoms (diarrhea for more than 48 hours)	6%	22.7%	0.013

Duration of diarrhea was longer when functional assays (toxin EIA and/or CCNA) were positive, i.e., 48 hours after diagnosis, 22.7% (18/79) of patients with a positive CCNA and/or EIA had diarrhea while only 6% (3/49) of the patients with GDH and PCR positive tests (non-functional assays) had diarrhea (p = 0.013). The difference was statistically significant. All 81 patients were started on CDI treatment within 24 hours of diagnosis.

CONCLUSION

- CDI rates differ with different diagnostic algorithms
- Inclusion of both, a functional assay (EIA and/or CCNA) and a sound clinical definition is critical for defining a case of CDI