

Comparison of the VIDAS® *C. difficile* GDH and the GDH component of the *C. diff* Quik Chek Complete for detection of *Clostridium difficile* in stools

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OBJECTIVE

The laboratory diagnosis of *Clostridium difficile* infection (CDI) is still challenging. Two- or three-step algorithms based on glutamate dehydrogenase (GDH) detection as a screening test are now recommended by American (ASM, SHEA/IDSA) and European (ESCMID) guidelines. GDH is a constitutive enzyme produced by *C. difficile* strains; detection of this enzyme in stools provides information about the presence of the bacterium. The objective of this study was to evaluate the performance of the new test VIDAS® *C. difficile* GDH (bioMérieux) and the GDH component of the *C. diff* Quik Chek Complete assay (Techlab®) compared to culture on TCCA medium.

METHODS

This prospective study was conducted at the National Reference Laboratory for *Clostridium difficile*, Université Pierre et Marie Curie, Paris. All diarrheic stools (taking the shape of the container) from patients > 2 years suspected of having *C. difficile* infection were included in the study.

Culture was performed on a selective medium (TCCA: brain heart infusion agar supplemented with 5% defibrinated horse blood, 0.1% taurocholate, 250 mg/ml cycloserine, and 8 mg/ml cefoxitin, home-made). Plates were incubated for 48 hours at 37°C in anaerobic atmosphere and strains were identified by mass spectrometry (Maldi-Tof, Bruker). VIDAS® *Clostridium difficile* GDH and *C. diff* Quik Chek Complete were performed directly on stools according to the manufacturer's instructions.



Figure 1 : A. *C. difficile* strain on TCCA B. VIDAS® C. *C. diff* Quik Chek Complete®

RESULTS

408 consecutive untreated diarrhoeal stool samples from patients suspected of CDI were collected from April 20th to July 29th 2012 from patients hospitalized in four different university-affiliated hospitals in Paris.

The prevalence of positive culture on TCCA was 13%: 77.4% of the isolates were toxigenic and 22.6% non-toxigenic.

Compared to culture on TCCA, the sensitivity, specificity, positive and negative predictive values were 96.2%, 97.7%, 86.4% and 99.4%, respectively, for the VIDAS® *Clostridium difficile* GDH (Table I).

Five results (1.2%) were undetermined with the *C. diff* Quik Chek Complete. After repeating the test, all results were negative. Compared to culture on TCCA, the sensitivity, specificity, positive and negative predictive values were 92.5%, 98.9%, 92.5% and 98.9%, respectively, for the GDH part of the *C. diff* Quik Chek Complete (Table II).

Discordant results are shown in Table III.

Table I : VIDAS® *C. difficile* GDH test versus culture on TCCA

		Culture on TCCA			total	Frequency (%)	CI 95%
		positive	negative				
VIDAS® <i>C. difficile</i> GDH	positive	51	8	59	Sensitivity	96.2	[85.9-99.3]
	negative	2	347	349	Specificity	97.7	[95.4-98.9]
total		53	355	408	PPV	86.4	[74.5-93.6]
					NPV	99.4	[97.7-99.9]

Table II : *C. diff* Quik Chek Complete GDH component versus culture on TCCA

		Culture on TCCA			total	Frequency (%)	CI 95%
		positive	negative				
<i>C. diff</i> Quik chek complete GDH component	positive	49	4	53	Sensitivity	92.5	[80.9-97.6]
	negative	4	351	355	Specificity	98.9	[96.9-99.6]
total		53	355	408	PPV	92.5	[80.9-97.6]
					NPV	98.9	[96.9-99.6]

Table III : Discordant results

No stools	Culture	VIDAS® <i>C. difficile</i> GDH	<i>C. diff</i> Quik Chek Complete GDH component
2	Pos	Pos	Neg
0	Pos	Neg	Pos
2	Pos	Neg	Neg
1	Neg	Neg	Pos
5	Neg	Pos	Neg
3	Neg	Pos	Pos

CONCLUSION

The negative predictive values of the VIDAS® *Clostridium difficile* GDH test and the GDH component of the *C. diff* Quik Chek Complete assay are excellent and therefore these methods represent valuable screening tests. In addition, VIDAS® *Clostridium difficile* GDH is an automated test, allowing easier interpretation and traceability of results.