Multicenter Prevalence Study Comparing Molecular and Toxin Assays for *Clostridioides difficile* Surveillance, Switzerland

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Abstract

Public health authorities in the United States and Europe recommend surveillance for *Clostridioides difficile* infections among hospitalized patients, but differing diagnostic algorithms can hamper comparisons between institutions and countries. We compared surveillance based on detection of *C. difficile* by PCR or enzyme immunoassay (EIA) in a nationwide *C. difficile* prevalence study in Switzerland. We included all routinely collected stool samples from hospitalized patients with diarrhea in 76 hospitals in Switzerland on 2 days, 1 in winter and 1 in summer, in 2015. EIA *C. difficile* detection rates were 6.4 cases/10,000 patient bed-days in winter and 5.7 cases/10,000 patient bed-days in summer. PCR detection rates were 11.4 cases/10,000 patient bed-days in winter and 7.1 cases/10,000 patient bed-days in summer. We found PCR used alone increased reported *C. difficile* prevalence rates by ≤80% compared with a 2-stage EIA-based algorithm.

Key Points

Differences in diagnostic algorithms for *C. difficile* can complicate comparisons between institutions and countries. This point-prevalence study evaluated stool samples from across Switzerland on two days in 2015 using PCR and EIA methods. Testing by PCR alone increased the reported *C. difficile* prevalence rate by ≤80% compared with a 2-stage EIA algorithm.

All stool samples were collected from 76 institutions across Switzerland on two specific days in 2015 and *C. difficile* testing was repeated in-house using the *C. DIFF QUIK CHEK COMPLETE®* test and a PCR test to detect the toxin B gene.

	Cases/10,000 Patient Bed-Days	
Detection Rate	**Winter**	**Summer**
PCR	11.4	7.1
EIA	6.4	5.7

Testing by PCR alone reported 20-78% more *C. difficile* events than using the *C. DIFF QUIK CHEK COMPLETE*® test alone. The study did not determine which samples came from patients who were colonized rather than infected with *C. difficile*.

Positive *C. difficile* specimens collected within one week of the point-prevalence collection days underwent ribotyping. The most common ribotypes were:

Ribotype	Frequency out of 107	Percentage of Total
RT014	12	11%
RT078 (presumably hypervirulent)	9	8%
RT002	7	7%
RT001	7	7%

The researchers did not recover hypervirulent RT027, in contrast to a pan-European study which identified RT027 as the most common circulating strain. RT078 is believed to be a hypervirulent strain, has been reported to affect younger patients, and may be transmitted through the food chain.

The authors state that the high level of discrepancy between different *C. difficile* testing methodologies highlights the need for consistent testing algorithms in order to facilitate interinstitutional and national comparisons and challenge the utility of current CDC and ECDC case definitions.

The authors noted that their results “strengthen the advice of the European Society of Clinical Microbiology and Infectious Diseases study group for *C. difficile* against the use of a single commercial test for diagnosing CDI because of the low positive predictive values when CDI prevalence is low.”