Comparison of PCR for Detection of tcdA and tcdB in Stool Samples and Direct Toxin Testing Versus Stool Culture for Diagnosis of Toxigenic Clostridium difficile from Hospitalized Patients in Egypt

Rawheya Fathy, Sherine Aly, Naglaa Abu Faddan and Enas Daef

Abstract:

Background: Clostridium difficile is an important pathogen associated with outbreaks of diarrhea and other intestinal disorders, such as pseudomembranous colitis. Methods: 95 pediatric patients suffering from diarrhea and 37 adult patients from Assiut University Hospital were included in this study. Stool samples were collected from each patient and were subjected to direct toxin immunoassay and culture on cycloserine/cefoxitin/fructose agar for 72hrs. Clostridium difficile isolates were confirmed by the use of API® strips. DNA was extracted from all Clostridium difficile isolates and stool samples and the presence of tcdA and tcdB (Toxin) genes were tested by the use of polymerase chain reaction. We compared the results of the toxin immunoassay and the direct detection of toxin genes with culture of C. difficile. Results: Clostridium difficile strains were isolated from 17 (17.9 %) pediatric and 10 (27 %) adult fecal samples and all the isolates were confirmed to contain tcdA and tcdB genes that are associated with toxin production "toxigenic culture". Considering the toxigenic culture as the gold standard, the sensitivities, specificities, positive and negative predictive values, and accuracies of the assays, respectively, were 100%, 89.7%, 68%, 100%, 91.6% for toxin A immunoassay in pediatric samples; 82.4%, 100%, 100%, 96.1%, and 96.7% for the direct PCR in pediatric samples; 100%, 96.3%, 90.9%, 100%, and 97.3% for toxin A immunoassay in adult samples; and 100%, 100%, 100%, 100%, and 100% the direct PCR in adult samples. Conclusion: Our findings indicate that direct detection of toxin genes in stool sample is considered a sensitive and specific method for detection of diagnosis C. difficile.

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