Epidemiological Study of Etiologic Organisms in Diarrheal Patients at Siriraj Hospital Using Real-time Polymerase Chain Reaction in Fecal Specimens

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Background: Laboratory diagnosis for infectious diarrhea usually relies on a combination of microscopy, culture and/or antigen detection. These methods are insensitive and time-consuming. Molecular methods have recently been developed and they are promising in detecting etiologic agents of diarrhea.

Objective: This study aimed to determine etiologic organisms in diarrheal patients using real-time polymerase chain reaction (PCR).

Methods: We conducted a cross sectional study in hospitalized patients admitted to Siriraj Hospital from December 2016 to December 2017 who had watery diarrhea for more than 3 days or at least once of mucous or bloody diarrhea. In addition to routine laboratory tests, fecal specimens were sent for real-time PCR assays using Allplex™ Gastrointestinal Full Panel Assay (AP) and FilmArray™ Gastrointestinal Panel (FA).

Results: This is a preliminary report of 91 enrolled patients. There were 49 male (53.8 %), with mean age of 67 years. Most common underlying condition was hypertension (58.2%), followed by diabetic mellitus (40.7 %), and dyslipidemia (40.7%). Stool cultures were positive in 2 out of 56 specimens (3.6 %); whereas, Clostridium difficile toxin assays were positive in 4 out of 84 specimens (4.8 %), all of which were also detected in both AP and FA assays. Enteric pathogens were discovered in 30.8% and 23.1% by AP and FA, respectively. The most common agents detected by AP was Aeromonas spp. (57.14%), followed by C. difficile toxin B (25%), Salmonella spp. (17.9%), and Enteropathogenic Escherichia coli (EPEC) (14.3%). AP was not able to detect Plesiomonas shigelloides, Campylobacter spp., and Sapovirus, which were found in 14.3%, 9.5% and 4.8% using FA, respectively. In contrast, FA was not able to detect Aeromonas spp. The most common pathogens detected by FA were C. difficile ToxinA/B (38.1%), followed by EPEC (33.3%), and Salmonella spp. (28.6%). Polymicrobial infection was detected in 25.0% and 42.9% of AP and FA, respectively.

Conclusion: Multiplex molecular panels allow clinicians to rapidly detect more enteric pathogens in diarrheal patients. Different molecular panels provide different detection of etiologic agents. Choosing an appropriate molecular method for routine use must be relevant to local epidemiology.

Keywords: Infectious diarrhea, Polymerase chain reaction, FilmArray, Allplex