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Case Report

Identification of Respiratory Syncytial Virus (RSV) Genome in the Stool of a Child with Acute Gastroenteritis

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Abstract

Background and Aims: Some viruses have been reported to cause respiratory and gastroenteric infections simultaneously. In this case we presented detection of human respiratory virus (RSV) type B genome from diarrheal sample of a 12 months' child with acute gastroenteritis .

Results: The results indicated the presence of RSV subtype B genome in all three stool samples. Moreover, no sign of co-infections with other enteropathogenic agents reported.

Conclusions: It could be a simple shedding of virus through gastroenteric system.

Keywords: Acute gastroenteritis, Respiratory Syncytial Virus (RSV), Viral gastroenteritis.

Introduction

Acute gastroenteritis is one of the major causes of mortality in the world in children under five (1). As a major cause of gastroenteritis, so far more than twenty viruses have been identified. The most common ones are Rotavirus, Adenovirus, enterovirus, Calicivirus and Astrovirus (2).

Respiratory Syncytial Virus (RSV) is one of the most common causes of acute respiratory infections that lead to death of children and infants (3). The RSV has been classified into 2 major subgroups RSV-A and RSV-B that often circulate concurrently (4). Each year, more than three million infants worldwide are hospitalized due to infection with this virus, while the mortality rate is more than 65 thousand in a year (5). Although, some viruses, like Enterovirus can simultaneously lead to respiratory infections and gastroenteritis, there have been no reports of RSV involvement in gastroenteritis. In this article, the isolation of RSV from a diarrheal sample of a patient suffering from acute gastroenteritis has been reported.

Case Presentation

A 12 months old female was hospitalized with fever, diarrhea with symptoms of high fever (temperature of 39°C), diarrhea (9 watery stools in the past 24 hrs prior to admission), irritating and refusal of breastfeeding that was started 2 days before admission and led to weight loss. Initial observations and test results were recorded as follow: direct tests and stool cultures were negative for the presence of parasitic infections and enteropathogenic bacteria. The test of red blood cell count, the quantitative CRP and electrolytes (Na+ and

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K+) showed no significant alterations. Three stool specimens were sent to the Laboratory of Virology for diagnosis of viral respiratory and gastrointestinal infections.

After extraction of the viral DNA/RNA (Viral Gene-spin, iNtRON, Korea) and the process of cDNA synthesis (Thermo Scientific™), a complete multiplex-PCR panel was performed to identify gastrointestinal bacteria; Salmonella spp. Shigella spp. Vibrio spp. Campylobacter spp. Clostridium difficile Toxin B, Clostridium perfringens, Yersinia enterocolitica, Aeromonas spp., E. coli O157:H7, Verocytotoxin-producing E. coli (VTEC) and viral genome including: Group A rotavirus (RotV), Enteric adenovirus (AdV), Norovirus GI/GII (NoV-GI/GII), Astrovirus (AstV)-Respiratory syncytial virus A (RSV A), Respiratory syncytial virus B (RSV B), Bocavirus 1/2/3/4 (HBoV), Metapneumovirus (MPV), Coronavirus 229E (CoV 229E), Coronavirus NL63 (CoV NL63), Coronavirus OC43 (CoV OC43), Enterovirus (HEV) (Seeplex Diarrhea ACE Detection and Seeplex RV15. Seegene, Korea). The results indicated the presence of RSV subtype B genome in all three stool samples. Moreover, no sign of co-infections with other enteropathogenic agents reported.

Several viruses have been reported that can cause both respiratory infection and gastroenteritis including newly identified bocavirus. Arthur et al, in 2009 reported a study of detection of bocavirus in fecal samples of children with acute gastroenteritis collected since 2001 (6). However the role of bocavirus as a causal agent of viral diarrhea is still debatable. Recent data shows evidence of evolving of human respiratory bocavirus 1 (HBoV1) from HBoV2, 3 and 4 predominantly found in feces (7). As an enteric pathogen coronavirus was detected in stool sample of patients with acute gastroenteritis in 1979 and it has been thought that this virus can cause both respiratory and enteric infection simultaneously (8). Recent studies however are skeptical about coronavirus as a gastroenteritis pathogen and the more surveys go on the less evidence about coronavirus role in the etiology of gastroenteritis would be found. The study of Paloniemi and colleagues recently showed presence of coronavirus in fecal sample of hospitalized children who had respiratory infection, acute gastroenteritis or symptoms of both with no causal association to acute gastroenteritis (9).

Although, RSV is the one of the most common cause of respiratory infection in children and neonate, finding genome of this virus in digestive system and fecal samples of a patient with acute gastroenteritis seemed unusual. Also several studies have shown detection of RSV genome in variety of organ for example blood, CSF, myocardium and archive of postmortem tissue (10). These data have indicated that RSV genome can be detected some times in extrapulmonary environments.

In this case the patient had typical symptoms of a viral diarrhea which probably was not caused by RSV. It is suggested that RSV genome can also be detected in stool samples of patients which probably is due to the swallowing and ingestion of respiratory secretions.

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