Letter to the Editor

Fatal Case of Norovirus Gastroenteritis Due to Severe Dehydration

Case Report

To the Editors—On November 25, 2006, a 1-year-old boy with frequent diarrhea and 4 vomiting episodes was transferred to the emergency room of our university hospital. He had recently received an operation for biliary atresia at 11 months of age, and he had only mild elevation of hepatic transaminase without jaundice. His serum electrolytes (143 mmol/L Na, 4.7 mmol/L K, 104 mmol/L Cl), blood urea nitrogen (15.3 mg/dL), and creatinine (0.13 mg/dL) levels were within normal range at the time of his initial visit to the hospital. He was treated with intravenous rehydration and allowed to return home. Two days later, he returned to the hospital because of continuous vomiting. We learned a lesson from the present case that it is necessary for infants or young children with norovirus gastroenteritis to be watched carefully even though the patient was previously a healthy child. He was immediately admitted because his general condition had clearly deteriorated in comparison to his initial hospital visit—he was unconsciousness and severely dehydrated. Cardiopulmonary arrest occurred shortly after admission to the hospital. His blood urea nitrogen (58.0 mg/dL) and creatinine (1.01 mg/dL) levels were elevated, and his serum potassium level was also markedly high (10.9 mmol/L). Postmortem analysis was not conducted because it was not permitted by his parents. Stool sample analysis was negative for enteric bacteria and rotavirus by culture.

To elucidate the causative agent for his gastroenteritis, stool and serum specimens collected on the day of his admission were tested for norovirus by reverse transcription-polymerase chain reaction (PCR) [1] followed by sequence analysis of positive PCR products. Potential cross-contamination was prevented by preparing stool and serum samples in different rooms. Identical norovirus genogroup(G) II sequences were detected in both stool and serum samples, which could be typed as GI.4 2006b and had 99% nucleotide identity to Kobe034/2006/Jp, the predominating norovirus strain circulating in Japan in 2006.

To the best of our knowledge, only 1 fatal case due to norovirus infection has been reported [2]. However, no further detailed virological analysis was performed. We detected norovirus RNA in both stool and serum samples of a 1-year-old boy who was admitted with acute gastroenteritis. Acute renal failure may have been caused by the patient’s severe dehydration, which may have resulted in the markedly high serum potassium levels.

Recently, we demonstrated the kinetics of rotavirus antigenemia in patients with rotavirus gastroenteritis and an association between the levels of antigenemia and the presence of fever [3]. Moreover, norovirus RNA was detected in various organs such as the liver, spleen, and lungs in small animal model analyses [4] and in the serum of norovirus gastroenteritis patients [5]. Identical GI.4 sequences were identified in both stool and serum samples in the case described here. Thus, the present data support the notion of systemic viral infection in patients with norovirus gastroenteritis. However, a major limitation of our present study and the previous reports with regards to the confirmation of systemic norovirus infection is that only a single patient was analyzed in each study. Additional studies are needed to confirm whether norovirus RNAemia or antigenemia routinely occurs in these patients.

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References


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