

Severe Rotavirus gastroenteritis in a patient with infant leukemia

İnfant lösemili bir hastada görülen ağır Rotavirus gastroenteriti

Ali Bay¹, Vuslat Boşnak², Enes Coşkun¹, Ali Seçkin Yalçın¹, Hatice Uygun¹, Samil Hızlı¹

¹Gaziantep Üniversitesi Tıp Fakültesi Pediatri Anabilim Dalı, Gaziantep, Türkiye

²Gaziantep Üniversitesi Tıp Fakültesi Enfeksiyon Hastalıkları Anabilim Dalı, Gaziantep- Türkiye

Geliş Tarihi / Received:21.10.2010, Kabul Tarihi / Accepted:16.12.2010

ÖZET

Rotavirus infant ve küçük çocuklarda ağır gastroenteritin en sık nedenidir. Bağışıklığı baskılanmış çocuklarda rotavirus gastroenteritinin klinik seyrine ait bildiriler az sayıdadır. Biz, bu raporda akut miyeloblastik lösemi tanısı ile izlediğimiz hayati tehdit edici rotavirus gastroenteriti gelişen bir infant olguyu sunarak, son zamanlarda tavsiye edilen Rotavirüs aşısına dikkat çekmek istedik.

Anahtar kelimeler: Rotavirus, lösemi, febril nötropeni, çocuk

ABSTRACT

Rotavirus is the most common cause of severe gastroenteritis in infants and young children. Reports about the clinical relevance of rotavirus in immunocompromised children are rare. We herein presented a case of life-threatening Rotavirus gastroenteritis in an infant with acute myeloblastic leukemia which could be prevented by recently recommended Rotavirus vaccination.

Key words: Rotavirus, leukemia, febril neutropenia, child

INTRODUCTION

Rotavirus is the most common cause of severe gastroenteritis in infants and young children. Worldwide incidence of rotavirus is estimated as 125 million cases of diarrhea annually. Rotavirus is transmitted through fecal-oral route. Most of the Rotavirus infections occur among children aged between three months to three years of age.^{1,2}

In immunocompetent children, rotavirus infection is a self-limiting disease of 3 to 6 days' duration. Infants are at risk of severe dehydration especially in developing countries, where nutrition and hygiene are not optimal. Reports about the clinical relevance of rotavirus in immunocompromised children are rare.³⁻⁵ In this paper, we presented a case of life-threatening Rotavirus gastroenteritis in an infant with diagnosis of acute myeloblastic leukemia, which could be prevented by recently recommended Rotavirus vaccination.

CASE REPORT

A 4-month-old male baby presented with fever, gingival bleeding, and paleness for 5 days. Before admission to our hospital, the baby had been received treatment for pneumonia in a local health care center. At presentation, the baby was irritable, pale, and febrile and had multiple petechiae and ecchymoses on the lower extremities. The liver and spleen were palpable 3 cm below costal margin. Rest of the physical examination was unremarkable. The results of the complete blood count were as follows: hemoglobin 7.1 g/dl, mean corpuscular volume (MCV): 74 fl, white blood cell count (WBC) 60x10⁹ /L (blast, 22%), and platelet count 37x10⁹/L. Bone marrow aspirate showed hypercellularity with 90% of blasts (myeloblasts) reactive for myeloperoxidase on histochemistry. The blasts were immunoreactive for CD13, CD14, CD33, CD34, and HLA-DR on flow cytometry. With these findings a diagnosis of acute myeloblastic leukemia was made. Serum biochemistry, coagulation parameters, vitamin B12, and folic acid levels were in the normal range. AML BFM

Yazışma Adresi /Correspondence: Doç.Dr. Ali Bay,

Gaziantep Üniversitesi Tıp Fakültesi, Sahinbey, Gaziantep, Türkiye Email: abay1968@yahoo.com

Copyright © Dicle Tıp Dergisi 2011, Her hakkı saklıdır / All rights reserved

2004 chemotherapy protocol was started leading to complete remission.

At the end of induction chemotherapy, irritability and fever appeared. The physical examination was unremarkable. On complete blood examination WBC and absolute neutrophil count were $300/\text{mm}^3$ and $100/\text{mm}^3$ respectively and diagnosis of febrile neutropenia was established. The intravenous fluid and amikasin, meropenem treatment was started. At the second day of fever, diarrhea started with increasing severity up to 15 stools per day and vomiting added to clinical findings at the end of second day. On physical examination, his temperature was 37.8°C ; the pulse rate was 135 beats per minute, and respirations were regular but tachypneic ($42/\text{min}$). He was, lethargic and dehydrated. The blood pressure was $95/60 \text{ mm/Hg}$. Biochemical analysis was revealed Blood urea nitrogen 128 mg/dl , Na 148 mEq/l , K 3.4 mEq/l , creatinin 0.9 mg/dl and stool analysis was positive for Rotavirus (Rotavirus and Adenovirus combo rapid test device was used to diagnosis of rotavirus in fecal specimens). C reactive protein (CRP) was 14 mg/dl . The patient had not received rotavirus vaccine. On blood gas analysis pH: 7.29 , HCO_3^- : 10 mEq/l , and pCO_2 : 20.7 mm/Hg . The patient was become severely dehydrated in spite of intensive i.v. hydration. Intravenous hydration treatment was increased up to 5000 cc/m^2 and bicarbonate was added. Diarrhea of patient went on at same severity for 3 days and than started to regress in number and vomiting decreased. No microorganism grew in his blood and urine cultures. At following week, Rotavirus antigen in stool became negative and at 7th day of follow up, the patient was started to begin breast feeding and chemotherapy was restarted again after 1 week.

DISCUSSION

In developing countries, rotavirus gastroenteritis is a major cause of childhood death and is responsible for approximately half a million deaths per year among children aged <5 years. The number of rotavirus infections makes peaks during winter and spring. Rotaviruses are shed in high concentrations in the stools of infected children and are transmitted primarily by the fecal-oral route. People who care for children, including health care and child-care workers, also can spread the virus, especially if they don't wash their hands after changing diapers.

Rotavirus is an important cause of nosocomial gastroenteritis⁶. Regarding the high potential of nosocomial infections due to rotavirus, it is suggested that children with acute diarrhea be isolated and that emphasis be put on some simple health points, such as hand-washing before and after the examination of each patient and cleaning the examination instruments after use in each patient which can be a great help in decreasing the prevalence of nosocomial infection. We diagnosed nosocomial rotavirus infection which started with fever and gastroenteritis in neutropenic period. Due to good hygienic standards and appropriate isolation of patient, our patients did not spread the infection. No further cases of rotavirus occurred on the pediatric hematology unit during this month. We could not confirm the source of Rotavirus infection.

Rotavirus infects almost all children by age 5 years, but severe, dehydrating gastroenteritis occurs primarily among children aged 3-35 months. The spectrum of rotavirus illness ranges from mild, watery diarrhea of limited duration to severe diarrhea with vomiting and fever that can result in dehydration with shock, electrolyte imbalance, and death. Dehydration is the major concern with rotavirus infection, as liquid is lost from the body through diarrhea and vomiting, and may not be easily replaced. Dehydration of our patient was very severe which needed to be supported with 5000 cc/m^2 intravenous fluids in the intensive care unit.

Immunity develops after the initial infection, so future infections tend to be less severe. There's no specific treatment for rotavirus gastroenteritis. Ensuring the child takes in enough liquid is essential. As human milk may contain IgG and IgA antibodies against rotavirus and the mucin-associated glycoprotein lactadherin, which binds specifically to rotavirus and inhibits its replication, infants receiving cancer chemotherapy and with rotavirus infection should be breast-fed for as long as possible.⁶ We think that breast feeding helped our patient for good clinical response even she was severely immune deficient.

In addition, children and adults who are immunocompromised because of congenital immunodeficiency, hematopoietic transplantation, or solid organ transplantation sometimes experience severe, prolonged, and even fatal rotavirus gastroenteritis. Liakopoulou et al.⁷ described 21 cases of rotavirus

infection in allogeneic stem cell transplantation recipients. Most of these cases may occur in clusters during the winter and spring period. Symptoms of rotavirus infection were diarrhea (95%), vomiting (62%), abdominal pain (38%), weight loss and loss of appetite in 38 and 29% of the cases, respectively. Reports about the clinical relevance of rotavirus in immunocompromised hospitalized children are rare. Rayani et al.⁴ retrospectively reviewed the clinical course of 28 pediatric cancer patients with positive rotavirus antigen tests. The first symptom of rotavirus infection was diarrhea in 47%, vomiting 32%, and fever in 21%. Symptoms lasted for a median of 7 days. Findings of our patient were similar to those of reported in literature.

The American Academy of Pediatrics (AAP) now recommends a rotavirus vaccine be included in the lineup of routine immunizations given to all infants. Two commercial formulations of rotavirus vaccine is available in the market and shown to be effective in preventing rotavirus infection.

Rotavirus is one of the possible causes of febrile neutropenia and gastroenteritis in infant leukemia patient. Rotavirus vaccine and frequent hand washing is the best tool to limit the spread of rotavirus infection.

REFERENCES

1. Zuccotti G, Meneghin F, Dilillo D, et al Epidemiological and clinical features of rotavirus among children younger than 5 years of age hospitalized with acute gastroenteritis in Northern Italy. *BMC Infect Dis* 2010;10:218-221.
2. Tekin A. Mardin'deki akut gastroenteritli çocuklarda Rotavirüs ve Enterik Adenovirüs sıklığı. *Klin Deney Ar Derg* 1; 41-45
3. Rogers M, Weinstock DM, Eagan J, Kiehn T, Armstrong D, Sepkowitz KA. Rotavirus outbreak on a pediatric oncology floor: possible association with toys *Am J Infect Control* 2000;28:378-380.
4. Rayani A, Bode U, Habas E, et al Rotavirus infections in paediatric oncology patients: a matched-pairs analysis. *Scand J Gastroenterol* 2007;42:81-87.
5. Fitts SW, Green M, Reyes J et al. Clinical features of nosocomial rotavirus infection in pediatric liver transplant recipients. *Clin Transplant* 1995;9:201-204.
6. Flem ET, Kasymbekova KT, Vainio K, et al. Rotavirus infection in hospitalized children and estimates of disease burden in Kyrgyzstan, 2005-2007. *Vaccine* 2009;27 Suppl 5:F35-39.
7. Guerrero ML, Moreno-Espinosa S, Tuz-Dzib F, et al. Breast-feeding and natural colonization with *Lactobacillus* spp as protection against rotavirus-associated diarrhea. *Adv Exp Med Biol* 2004;554:451-455.
8. Liakopoulou E, Mutton K, Carrington D et al. Rotavirus as a significant cause of prolonged diarrhoeal illness and morbidity following allogeneic bone marrow transplantation. *Bone Marrow Transplant* 2005;36:691-694.