Case Report / *Olgu Sunumu*

DOI: 10.5578/ced.202119820• *J Pediatr Inf 2021;15(2):e112-e114*

A case of Human Parechovirus Infection in an Infant with Meningitis

Menenjitli Bir Bebekte İnsan Parekovirüs Enfeksiyonu Olgusu

Semih Tokak[1](İD), Mehmet Özdemir[2](İD), Yasemin Derya Gülseren[2](İD), Hüseyin Çaksen[3](İD)

[1] *Department of Medical Microbiology, KTO Karatay University Faculty of Medicine, Konya, Turkey*
[2] *Department of Medical Microbiology, Necmettin Erbakan University Meram Faculty of Medicine, Konya, Turkey*
[3] *Department of Pediatrics, Necmettin Erbakan University Meram Faculty of Medicine, Konya, Turkey*

Cite this article as: Tokak S, Özdemir M, Gülseren YD, Çaksen H. A case of human parechovirus infection in an infant with Meningitis. J Pediatr Inf 2021;15(2):e112-e114.

Abstract

Human parechovirus is a potentially serious viral infection in neonates and infant and its importance increasing by years. In young infants, the typical clinical presentation includes fever, severe irritability, and rash, often leading to descriptions of "hot, red, angry babies". We report a case of a 43-day-old girl with a fever that required hospitalization and in which human parechovirus was identified in the cerebrospinal fluid. Blood, urine, and cerebrospinal fluid bacterial cultures of the patient were negative and the patient has improved.

Keywords: Parechovirus, infant, meningitis

Öz

İnsan parekovirüsü (HPeV), yeni doğanlarda ve bebeklerde potansiyel olarak ciddi bir viral enfeksiyon olup önemi her geçen yıl artmaktadır. Küçük bebeklerde tipik klinik tablo ateş, şiddetli sinirlilik ve döküntüyü içermekte ve sıklıkla "ateşli, kızıl, kızgın bebekler" tanımlarına yol açmaktadır. Bu çalışmada "Hastaneye yatmayı gerektiren ateşi olan ve beyin omurilik sıvısında insan parekovirüsünün tespit edildiği 43 günlük bir kız çocuğu" olgusunu sunuyoruz. Hastanın kan, idrar ve beyin omurilik sıvısı bakteri kültürleri negatif çıktı ve hasta iyileşti.

Anahtar Kelimeler: Parekovirüs, bebek, menenjit

Introduction

Human parechoviruses (HPeVs) are members of the Picornaviridae family, which are small and non-enveloped RNA viruses. These viruses were first isolated in 1956 and named as echoviruses 22 and 23. However, they have been classified in the parechovirus genus since 1997 (1). There are 19 known types of HPeV. Most of the diseases caused by these types are seen in infants younger than three months, and these cases are mostly caused by HPeV type 3 (HPeV3) (2). HPeV viruses are transmitted to patients by fecal-oral or respiratory tract (3). However, HPeVs replicate in the respiratory system and can also be found in respiratory secretions. Most HPeV infections occur in children. It usually causes mild upper respiratory tract or gastrointestinal symptoms in children (4). HPeV infections are one of the most important causes of outbreaks in infants. These viruses may present with a sepsis-like picture with central nervous system (CNS) involvement, which is difficult to distinguish from bacterial sepsis (2,5,6). They cause moderately increased inflammatory marker levels and minimal

Correspondence Address / Yazışma Adresi
Semih Tokak
KTO Karatay Üniversitesi Tıp Fakültesi,
Tıbbi Mikrobiyoloji Anabilim Dalı,
Konya-Türkiye
E-mail: semihtokak@gmail.com

Received: 15.10.2020 **Accepted:** 24.03.2021 **Available Online Date:** 26.07.2021

cerebrospinal fluid (CSF) pleocytosis and may also occur with seizures or significant neurological impairment (7). Herein, it was aimed to report a case of HPeV meningitis observed in an infant.

Case Report

A 43-day-old infant girl was admitted to the pediatric emergency department with a complaint of fever (38.5°C), cough, sneezing and sucking weakness. She was delivered at a gestational age of 39 weeks (birth weight: 3800 g) by vaginal delivery. She was being breastfed and she lived with her healthy parents and brother. She fell from a height of 30-40 cm onto the carpet four days ago. There were no cold symptoms in the brother. Her family's medical history was also unremarkable. No one in her family had cold symptoms or any illness prior to this illness.

Physical examination revealed petechial rashes on the sternum and cheeks. The patient's vital signs were as follows: Body temperature 38.5°C, respiration rate 50 breaths/min, heart rate 140 beats/min, and blood pressure 80/50 mmHg. Anterior fontanel was 2x2 cm and sunken. Rest of her physical examinations were normal.

Laboratory findings during admission were as follows: Brain MRI was normal. There was no evidence of white matter lesions. Hemoglobin 11.9 g/dL; white blood cell count 7.100/mm^3; absolute neutrophil count 620/mm^3; platelet count 392.000/mm^3; albumin 3.77 g/dL (normal range 3.8-5.4 g/dL); and C-reactive protein 6.14 mg/L (normal range 0-5 mg/L). On CSF examination, color was clear, glucose: 31.6 mg/dL (simultaneous blood glucose 93 mg/dL), protein 446.4 mg/dL, chloride 118.6 mg/dL. Microscopic examination of CSF revealed 11 lymphocytes/mm^3. Rapid antigen tests were used for influenza type A and B viruses and the test was negative.

Soon after admission, antibiotic therapy with cefotaxime (200 mg/kg/day) and vancomycin (60 mg/kg/day) were started, as a CNS disease was suspected. On the second day after hospitalization, she presented high fever. Regarding the patient's fever persistence and considering the age, her antibiotic therapy was changed considering Listeria infection. Vancomycin treatment was stopped ,and ampicillin (400 mg/kg/day) was started. On the fourth day of hospitalization, she developed mild diarrhea. Rotavirus and adenovirus fecal antigens were negative. On the fifth day of hospitalization, reverse transcription (RT)-PCR assays of CSF were negative for herpes simplex virus, cytomegalovirus, varicella zoster virus, and enterovirus, but HPeV was found positive. Unfortunately, genotyping HPeV could not be performed due to very low viral load in CSF. On the fifth day of hospitalization, her clinical condition was better. Antimicrobial therapies were discontinued because blood and CSF cultures were negative. The patient was discharged after 8 days of hospitalization.

Discussion

The most common symptoms of HPeV infection are fever, irritability, poor feeding, tachycardia, and rash (2). The most common clinical symptoms in hospitalized children are fever, poor feeding, neurological symptoms (irritability and seizures) and rash (5,8). In our case, the infant was a full-term, healthy baby and the observed symptoms (irritability and fever) were more related to the sepsis-like syndrome. CNS involvement was mild, she had no seizures, and intensive support was not required.

One of the common symptoms of HPeV infection is maculopapular rash. Shoji et al. have shown that most infants with HPeV3 sepsis-like syndrome develop an erythematous palmar and plantar rash within five days after the onset of fever (9). A study conducted on children with meningitis and encephalitis has revealed that HPeV is associated with maculopapular rash and seizures in young infants ($p< 0.0001$) (10). As in other studies, petechial rash was seen in our patient.

The most common symptoms seen in patients with HPeV CNS infection are lack of CSF pleocytosis and normal protein and glucose levels in CSF (1). Sharp et al. have reported that CSF pleocytosis was less common in HPeV infections (2%) than enterovirus infections (41%), and mean CSF white blood cell counts and protein levels were also significantly lower in HPeV infections (11). Britton et al. have reported nine infants with HPeV encephalitis aged <2 months. In their study, HPeV was detected in the CSF samples of all cases, but CSF pleocytosis was lacking in all cases (7). In our case, CSF glucose level was low and pleocytosis was absent.

With the advent of more sensitive molecular assays, HPeV is now recognized as a small but significant cause of illness in infants aged <3 years. In many studies, a number of serious infections such as sepsis-like disease and CNS infections (meningitis or encephalitis) have been described in infants younger than three months (12,13). Our case was 43 days old and consistent with the studies.

There are several studies on parechovirus in our country (4,14,15). However, no studies have been conducted in children with meningitis so far. Our study is important in terms of being the first reported case of meningitis from Turkey.

Tokak et al. (4) have analyzed 1110 nasal swab samples collected from children with respiratory tract infections. HPeV was detected in 4 (0.36%) of the 1110 samples in this study. Bozkurt et al. (14) have analyzed 240 virus-positive stool samples collected from children with acute gastroenteritis. HPeV was detected in 21 (16%) of 240 stool samples in the study. Aldemir-Kocabaş et al. (15) have analyzed nasopharyngeal aspirate samples collected from febrile neutropenia patients. HPeV was detected in 1 (1%) of the 100 patients in this study.

Conclusion

We reported a case of a 43-day-old girl with HPeV related meningitis. In recent years, HPeVs have emerged as a cause of morbidity, especially in infants. Clinicians should be aware that HPeVs may be an infectious agent in neonates and infants and should be considered as part of the differential diagnosis for neonates and infants with septicemic symptoms without an enhanced inflammatory response and without CSF pleocytosis.

Informed Consent: Patient consent was obtained.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - ST, YDG; Design - ST, HÇ; Supervision - MÖ, HÇ; Resources - ST, MÖ; Data Collection and/or Processing - ST, YDG; Analysis and/or Interpretation - ST, HÇ; Literature Review - ST, YDG; Writing - ST, HÇ; Critical Review - MÖ, HÇ.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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