Brain & Development 36 (2014) 70–73

BRAIN & DEVELOPMENT
Official Journal of the Japanese Society of Child Neurology

www.elsevier.com/locate/braindev

Case report

A case of neonatal human parechovirus encephalitis with a favourable outcome

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Received 29 January 2012; received in revised form 14 December 2012; accepted 16 December 2012

Abstract

Human parechoviruses (HPeVs) are a new family of neurotropic viruses that cause central nervous system (CNS) infections similar to enterovirus (EVs) meningoencephalitis in the neonatal period, resulting in white matter lesions that can be visualized with cranial ultrasonography and magnetic resonance imaging, and correlated to a large spectrum of neurological outcomes. HPeV should be suspected in neonates with signs and symptoms of sepsis-like illness or CNS disease. We report a case of neonatal HPeV encephalitis, diagnosed on the basis of clinical and radiological findings and HPeV RT-PCR, with a good neurological outcome.

Keywords: Parechovirus; Enterovirus; Neonatal encephalitis; Magnetic resonance imaging; RT-PCR

1. Introduction

Human parechoviruses (HPeVs) are members of the Picornaviridae family, including enteroviruses (EVs), and are classified into 16 genotypes [1,2], (http://picornaviridiae.com/parechovirus/hpev/hpev.htm). HPeV1 and HPeV2 infections are most commonly associated with mild respiratory or gastrointestinal symptoms and occasionally with severe conditions, such as flaccid paralysis and encephalitis/encephalomyelitis [3]. Neonatal HPeV3 infection has been associated with central nervous system (CNS) symptoms such as transient paralysis [4]. Although HPeV genotypes 4–16 were identified in a number of different countries, their clinical role remains to be clarified [2]. Verboon-Maciolek et al. [5] reported on 10 neonates with HPeV3 encephalitis where the clinical and neuroradiological presentation was similar to neonatal EV CNS infection [6]. Both viruses are neurotropic and can cause white matter lesions that can be visualized with cranial ultrasonography and magnetic resonance imaging (MRI) [7]. Thus, both EV and HPeV should be suspected and routinely

Abbreviations: HPeV, human parechovirus; EV, human enterovirus; CNS, central nervous system; MRI, magnetic resonance imaging; RT-PCR, reverse transcription polymerase chain reaction; CSF, cerebral spinal fluid; DWI, diffusion-weighted imaging; ICU, intensive care unit

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0387-7604/$ - see front matter
http://dx.doi.org/10.1016/j.braindev.2012.12.006

investigated by RT-PCR in neonates with signs and symptoms of CNS disease. We report a case of neonatal HPeV encephalitis, diagnosed on the basis of clinical and radiological findings, and HPeV RT-PCR.

2. Case report

A 9 day-old boy, born full term by vaginal delivery without complications, was admitted to the Emergency Department of IRCCS Giannina Gaslini (August 2010) for a 1 day history of drowsiness, decreased oral intake, and fever to 38.5 °C in the absence of gastrointestinal or respiratory symptoms. At home the patient was treated with oral cephalosporin, prescribed the day before by his paediatrician. The father reported a self-resolving episode of diarrhoea 3 days before but his stool sample was not examined.

On admission, the child was alert but irritable, with a temperature of 38.5 °C and a heart rate of 170 beats per minute. The respiratory rate, oxygen saturation, and blood pressure were normal for age. On physical examination no rash, petechiae, bulging of the fontanel, or cranial nerve deficits were observed. Initial laboratory tests are summarized in Table 1.

To the febrile and irritable neonate, an empiric antibiotic therapy with ampicillin and gentamicin, was administered while waiting for the results of blood, nasopharyngeal swab, stool and urine cultures. Maternal milk culture was also obtained. Results of viral serologies and serum PCR are summarized in Table 1. Cranial ultrasonography was normal.

The neurological evaluation at day 1 showed irritability, flexor hypertonia, and normal evoked tendon reflexes. Laboratory results were normal (Table 1). To the persistent irritability and plaintive tears, and to the suspicion of a CNS disease, an unsuccessful lumbar puncture was performed. At this point, MRI was recommended, but parents refused the test, therefore a second cranial ultrasonography was performed with normal findings. Intravenous acyclovir was also administered.

On day 2, the infant developed abdomen distension and was treated with intravenous albumin (serum level: 2343 mg/dL), and diuretic therapy. Abdominal ultraso-

Table 1
Clinical findings, laboratory testing and other investigations performed during the first 5 days of hospitalization.

Follow-up (days)	Signs and symptoms	Laboratory testing	Other investigations
0[a]	Fever, irritability ++	Leukocyte count: 11.8×10^9 cells/L with N 51.9%, L 22.9%, LUC 7.9%; Hb and PTL levels: normal. CRP, procalcitonin, transaminases, coagulation profile, urinalysis: normal. Coxsackievirus A and B, echovirus, HSV 1 and 2, EBV, CMV, parvovirus B19, respiratory viruses serologies: negative. HSV 1 and 2, HHV-6, adenovirus, parvovirus B19, EBV, CMV and EVs real time PCR on blood: negative. Blood, nasopharyngeal swab, stool, urine, maternal milk cultures: negative.	Cranial ultrasound: negative
1	Irritability ++, plaintive tears, flexor hypertonia and normal evoked tendon reflexes	Leukocyte count: 11.2×10^9 cells/L N 43.1%, L 19.1%, LUC 15.8%; Hb and PTL levels: normal CRP and procalcitonin: normal	Cranial and urinary ultrasound: negative Lumbar puncture: because of blood stain, no reliable CSF cell counts and other investigations could be obtained
2	Irritability ++, swelling+++ with a meteoric abdomen	Albumin: 2343 mg/dl (normal value: 3800–5400)	Cranial ultrasound: negative
3	Irritability ++, swelling ++ with a meteoric abdomen	Albumin: 2481 mg/dL (normal value: 3800–5400)	Cranial ultrasound: negative Abdominal ultrasound: mesenteric hyperemia and a mild peritoneal effusion
4	Irritability +++ (brain MRI required), swelling++ with a meteoric abdomen	Albumin: 2521 mg/dL (normal value: 3800–5400) Ferritin 1698 ng/ml (normal value 150–450) Coagulation profile: normal for age	Brain MRI: multiple small white matter lesions suggestive for EV or HPeV encephalitis (Fig. 1) EEG: symmetrical, irregular activity with sporadic medium-ample voltage peaked elements on frontal, central and temporal regions, in particular at the left hemisphere
5	Irritability +, swelling + with a meteoric abdomen	HPeV real-time RT-PCR on blood: positive HPeV real time RT-PCR on nasopharynx swab: negative	/

+ Mild; ++ moderate; +++ severe; / not performed; neutrophils: N; lymphocytes: L; LUC: large unstained cells; hemoglobin: Hb; platelet: PTL; CRP: C-reactive protein; HSV-1 e 2: herpes simplex virus 1 and 2; EBV: Epstein Barr virus; CMV: citomegalovirus; HHV-6: herpes virus 6.
[a] Days from admission.