A case of young infant HPeV1 infection with intraventricular hemorrhage

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There is no conflict of interest in this study.

【Back ground】

Human parechoviruses (HPeVs) are RNA viruses that are classified in the family Picornaviridae and 17 genotypes are confirmed. In European study HPeV was detected in 3-8% of children presenting to emergency with undifferentiated fever and in children requiring hospital admission, where up to 15-20% of children with fever without source are HPeV-positive. Serological data from Japan show that 90% of infants have been infected with at least one HPeV subtype by the age of 2 years . HPeVs usually cause mild respiratory or gastrointestinal symptoms, but HPeV1 and HPeV3 are known that they can provoke sepsis and meningoencephalitis leading to neurological sequelae in neonates and young infants.Here we report a case of HPeV1 infection with Intraventricular hemorrhage.

【Case】

Age: 2 months, Sex: male
<Perinatal history>
Gestational age:36w0d
Birth weight 2388g, MD twin
<CC>
Fever, Scarlet Skin, irritable
<History of present illness>
X-2days Poor suckling, irritable
X-1day Fever (admitted in local hospital)
X-day Transferred Kurume University Hospital due to sepsis.
<sick contact>
Not in particular.
<Vaccination>
Hib ×1, PCV ×1

<Physical finding>

HT: 60cm (+1.0 SD) , BW: 6.1kg (+0.9 SD)
BT: 38.1℃, HR: 205bpm, BP: 100/70mmHg, RR: 44/min, SpO2: 98%
General condition: not doing well
irritability(+)
Head: fontanelle open flat, Neck stiffness(+)
Throat: slightly injected,
LNS: not palpable,
Chest: no rale, regular, no murmur, III(-)
Abdomen: soft, mass(-), BS normal
Skin: rash on face and perineum
Pupils: 3mm/3mm, reflex +/+,
Nystgmus:(-)
Babinski -/- Chaddock -/-

<Blood gas>

pH 7.400
pCO2 32.7 mmHg
HCO3 19.8 mmol/l
B.E 3.8
Lac 1.9 mmol/l

<Biochemistry>

Alb 3.6 g/dl
Tbil 0.9 mg/dl
AST 976 IU/l
ALT 517 IU/l
LDH 2387 IU/l
CK 2167 IU/l
CK-MB 194 IU/l

<Coagulability>

APTT 44.5 sec
PT(ACT) 48 %
PT(INR) 1.49
FDP 49 mg/dl
AT 59 %

CRP 2.3 mg/dl
PCT 28.6 ng/dl
Na 142 mEq/L
K 5.0 mEq/L
Cl 112 mEq/L
Ca 9.5 mg/dl

<CBC>

WBC 12200 /μl
Neut 25 %
Lymph 71 %
RBC 358 10^4 /μl
Hb 9.7 g/dl
Plt 34.0 10^4 /μl

BUN 8.5 mg/dl
Glu 91 mg/dl
Ferritin 212 ng/dl
IL2R 2074 U/ml
PIVKA II 37 mAU/ml
proBNP 5522 pg/ml

<Chest X-ray> CTR: 56%, no abnomal findings
<Heart US> EF:70%,
no valvular regurgitation, no pericardial effusion

〈Figure 1〉 Clinical course

〈Viral genetics test〉

Samples :
blood, spinal fluid, throat swab, urine, feces
Results :
Parvovirus B-19 : negative
Adenovirus :negative
Echovirus: negative
Herpes simplex virus:negative
Cytomegalovirus:negative
Enterovirus (universal):positive (blood, feces)
Human parechoviruses 1 :positive (blood, feces)

〈Clinical course〉 (Figure 1)

Meropenem and aciclovir were prescribed for empiric treatment of sepsis caused by unknown and thrombomodulin was combined for DIC. He became afebrile on day 5 and his systemic condition was improved. In a head CT on day 4, Intraventricular hemorrhage was found at posterior horn of lateral ventricle. (Figure 2)
With conservative treatment , hemorrhage was disappearing on day 11. HPeV1 was detected by blood and fecal PCR and it was thought that a series of symptoms were caused by viremia of HPeV1. There are no previous neurologic sequelae at hospital discharge.

〈Figure 2〉 Head CT

【Discussion】

HPeVs infections are most commonly associated with mild gastrointestinal or respiratory symptoms. HPeV3 has been associated with more-severe disease, such as neonatal sepsis and meningitis.[1] Compared with HPeV3, HPeV1 symptoms are relatively mild and there are few CNS symptoms. There is no report of HPeV1 that caused cerebral hemorrhage so far. This case is important that it can merge intraventricular hemorrhage even with HPeV1 infection. [2]
This case had clinical symptoms of sepsis with evaluation of DIC score and met criteria for SIRS. It seemed that vascular endothelial damage was caused due to cytokine storm, therefore LDH and IL2R, PCT were elevated, and might be relevant to the Intraventricular haemorrhage. [3]

【Take home message】

In case of young infant with clinical symptoms of sepsis, it is necessary to rule out HPeVs infection. And consideration the possibility of cerebral hemorrhage is important not only HPeV3 infection but HPeV1.

【References】

1. Wolthers KC, et al: Clin Infect Dis 47:358–363, 2008
2. Eur J Pediatr. 2015 Dec;174(12):1639-47.Epub 2015 Jun 25
3. Fortuna, et al: J Clin Virol. 2017 Jan;86:39-45