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Case Report

Early Onset Neonatal Sepsis due to Enterovirus in Cerebrospinal Fluid: A Case Report

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Received: February 23, 2023; **Published:** March 12, 2023

Abstract

Enterovirus is a RNA virus that belongs to the Picornaviridae family and can be classified into 4 different species. neonatal enterovirus infection is common but is usually asymptomatic. There are case reports from literature of enterovirus infection which describe a large variety of symptoms which seems to affect more severely neonates than older children. The present case report described a two day old newborn who started with weight loss greater than 10% regarding birth weight, jaundice and lethargy. Progressive neurological worsening which includes seizures and persistent apnea episodes requiring mechanical respiratory support. Additional tests suggesting neonatal sepsis. Neurological approach with positive RNA for Enterovirus in cerebrospinal fluid.

Keywords: *Enterovirus; Early Onset Sepsis; Neonatal Enterovirus; Neonatal Sepsis*

Introduction

Enterovirus is an RNA virus that belongs to the Picornaviridae family and can be classified into 4 different species. The Enterovirus classification is based on molecular serotyping, which includes determination of the nucleotide (RNA) sequence encoding the viral polypeptide capsid [6].

Enterovirus affect millions of people worldwide from all age groups. is a common cause of infection in neonates.

Enterovirus infections have variable manifestations. Asymptomatic infections account approximately 50%. Non-polio enteroviruses cause about 10 to 15 million infections and tens of thousands of hospitalizations each year in the United States. Most people who get infected with these viruses do not get sick or they only have mild illness, like the common cold. But some people can have serious complications, especially infants and people with weakened immune systems [8]. Newborns infected with a non-polio enterovirus may develop sepsis. However, this is very rare.

Symptomatic enterovirus infections range from non-specific febrile illness to life-threatening diseases such as myocarditis or sepsis.

Molecular serotyping (RNA sequence)	
Group A	Coxsackievirus A serotypes 2-8, 10, 12, 14, 16; Enterovirus serotypes 71, 76, 89-92
Group B	Coxsackievirus A serotypes 9; B Serotypes 1-6 Echovirus serotypes 1-7, 9, 11-21, 24-27, 29-33 Enterovirus serotypes 69, 73-75,77-88, 93, 97, 98, 100, 101, 106, 107
Group C	Poliovirus serotypes 1-3; Coxsackievirus A serotypes 1, 11, 13, 17, 19-22, 24
Group D	Enterovirus D68, D70, D94, D111

Table: *Adapted from http://www.picornastudygroup.com/taxa/taxa.htm.*

Infections in newborns may be acquired vertically before, during, or after delivery, horizontally from family members, or by nosocomial transmission in nurseries [2].

Case Report

A two day old female (46 hrs) with no significant prenatal history started weight loss greater than 10% regarding birth weight, associated to jaundice. Blood tests showed non isoimmune hyperbilirubinemia requiring phototherapy. Treatment is initiated in the room along with both parents and maintained for about 24 hrs.

At 4 days old (96 hours) she began clinical deterioration with cutis marmorata, persistent jaundice, temperature instability, lethargy, poor feeding, and decreased distal perfusion combined by respiratory pauses, so she was admitted to the NICU where empirical intravenous antibiotic therapy was initiated as a suspected early sepsis.

Worsening of respiratory symptoms, with nasal CPAP support needed without supplemental oxygen requirements.

Hemodynamic instability with bradycardia, persistent hypertension, recurrent apneas and hypertonia of 4 extremities with continuous sucking requiring mechanical ventilation suspecting neonatal seizures, we started seizure treatment with phenobarbital and sedation for about 32 hrs.

Complementary tests were performed, video electroencephalogram, transfontanelar ultrasound, magnetic resonance, all of which were found to be normal.

Routine blood tests show white blood cells of 6.7/mm^3; lymphocyte count to 1.0/mm^3 and neutrophilic count to 4.4/mm^3; Hemoglobin of 15 gr/dl (maintaining an stable number in all the other blood tests); Initial serum PCR in 6.11 mg/L reaching a maximum of 25 mg/L. Liver function tests with progressively decreasing total bilirubin, reaching maximum of 14.1 mg/dL on the 4^{th} day of life, electrolytes and all the other balances were no contributive. Empirical antibiotics were administrated until bacterial infection could be ruled out.

A lumbar puncture is performed, obtaining leukocytes 25 cel/nL, Glucose 38 mg/dL, proteins 87.89 mg/dL and cerebrospinal fluid culture showing positive RNA for enterovirus.

Neurological alterations were discarded and due to an isolated enterovirus found in cerebrospinal fluid, it was decided to wean the patient from mechanical ventilation without incident at 6 days old. Absence of new convulsive episodes after extubation were reported. Anticolvulsants were discontinued.

Going through perinatal history, we found an episode of maternal acute gastroenteritis (diarrhea, nausea, vomiting) at 34 gestational weeks. She did not receive any treatment and spontaneously remitted after one week of symptoms.

7 days after birth, a maternal blood sample is taken to determine the presence of IgG antibodies for Enterovirus with positive results for Enterovirus serotype 68 - 71.

At 14 days old after a complete remission of neurological or sepsis like symptoms, it was decided to discharge the patient home.

Discussions

Enteroviruses are highly contagious spreading through fecal-oral and respiratory secretions [6].

Neonates are at high risk of disseminated disease resulting from enterovirus infections acquired during the perinatal period. Most of the infections are due to echoviruses (serotypes 6, 9 and 11), group B Coxsackie viruses (serotypes 1 - 5) and Polioviruses (serotype 3) [6].

Enterovirus infections acquired perinatally present within the first postnatal week. Onset of serious enterovirus infection beyond 10 days of age is uncommon. A wide range of clinical disease has been reported in neonates, including nonspecific febrile illnesses, exanthems, and aseptic meningitis. Neonates are at high risk of disseminated disease resulting from enterovirus infections acquired during perinatal period [6].

The outcome of neonatal infection is strongly influenced by the presence or absence of passively acquired maternal antibody specific for the infecting Enterovirus serotype [6]. Maternal history often reveals a recent viral illness with fever and frequent abdominal pain [2].

Based on evidence, treatment is symptomatic, with no presently available antiviral therapy for non-several cases [6].

Conclusion

Neonatal enterovirus infection is common, however neonatal enterovirus infections may be asymptomatic or may cause a variety of diseases. This case was an uncommon serious enterovirus infection with severe neurological manifestations influenced by the presence of acquired maternal enterovirus infection during pregnancy. As literature describes there is no specific treatment for Enterovirus infections. The mainstay of management is supportive care whether the presentation is a mild or a life-threatening viremia (6) which in this case we had. As we´ve seen this Enterovirus infection. Self-limited with no specific therapy needed but the supportive care. Further studies are still needed to determine the benefit of the intravenous immunoglobulin and the antiviral drug pleconaril in severe enterovirus infections due to the high mortality rate.

Conflict of Interest

Authors must declare any personal circumstances or interest of the reported study. If there is no conflict of interest, mention as “The authors declare no conflict of interest”.

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Volume 12 Issue 4 April 2023