Neonatal Chikungunya Presented as Apnea

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Souradip Banik[1], Kumar Ankur[1], Sanjeev Chetry[1] and Aparna Prasad[1]

Abstract

Neonatal Chikungunya virus (CHIKV) infection is sporadic, and the prevalence of the entity has been described only recently. Neurological complications in adults have been reported, but there is a lack of data in this regard in neonates. In this retrospective case series done during the outbreak of Chikungunya, we observed 7 neonates who presented with fever, irritability, excessive cry, and rash, which was confirmed by polymerase chain reaction. Out of 7, 5 neonates presented with encephalopathy with apnea and seizures (80%), which were the most common presenting symptoms. Identifying this entity based on clinical and epidemiological background helps in management and aids in prognostication of the affected neonate.

Keywords:

Neonatal Chikungunya, encephalopathy, apnea

Introduction

The chikungunya virus (CHIKV) is an alphavirus transmitted by the *Aedes* mosquito, and occasionally it can lead to vertical transmission from symptomatic mother to baby. In approximately 50% of the cases, transmission occurs during the peripartum period if the mother has acquired infection during this period.[1,2] Clinical signs and symptoms of Chikungunya in adults and children are preceded by an incubation period of 4 to 7 days. The incubation period of Chikungunya in older children and adults is 4 to 7 days, whereas neonates who acquire infection through vertical transmission present at 3 to 5 days of life. Clinical features of neonatal Chikungunya are fever, irritability, maculopapular rash, centrofacial region pigmentation, apnea, and rarely with shock and disseminated intravascular coagulation or encephalopathy-like features. Severe white matter injury in magnetic resonance imaging has been found in neonates who presented with features of encephalopathy due to perinatal chikungunya.[2]

Methods

Clinical data of all neonates diagnosed with Chikungunya was collected retrospectively. Maternal history of fever and illness prior to delivery which was later confirmed to be due to Chikungunya with DNA polymerase chain reaction (PCR) was collected. Clinical, radiological, and biochemical profile of the neonates was analyzed which was later found to be associated with neonatal Chikungunya after confirmation with chikungunya PCR. Response to treatment and neurological status at the time of discharge was also noted. Other causes of encephalopathy were ruled out by doing relevant investigations like cerebrospinal fluid (CSF) analysis, blood culture, urine culture, blood gas, metabolic workup (blood sugar, calcium, magnesium, and sodium), ultrasound cranium, and magnetic resonance imaging (MRI) of the brain.

Settings

Level III Neonatal Unit at a Referral Hospital in North India.

Results

We had 5 cases of neonatal Chikungunya admitted over a period of 2 months during the outbreak in Delhi. Out of the 5 neonates, 4 presented within the first week of birth with fever, apnea, lethargy, and with the refusal of feeds. In these 4

[1] Department of Neonatology, BLK Superspeciality Hospital, New Delhi, Delhi, India

Corresponding author:
Kumar Ankur, Room No- 26, OPD-1. BLK Superspeciality Hospital, Pusa Road, Delhi 110005, India.
E-mail: sahankur@gmail.com

neonates, the vertical transmission of Chikungunya was confirmed by PCR in the mother-newborn dyad (Table 1). A history of maternal fever and bone pains was present in 4 out of 5 cases (80%). The examination findings at the time of admission were consistent with features of encephalopathy in all 5 neonates. Investigations showed thrombocytopenia (60%), elevated C-reactive protein (40%), CSF pleocytosis (80%), hypoglycorrhachia (60%) (Table 2). During stay 3 out of 5 (60%), neonates developed hyperpigmentation that classically started over the perioral area that later progressed to involve the trunk and the limbs. All the babies presented with encephalopathy with apnea and required respiratory support for stabilization. Two neonates required ventilatory support for poor efforts and frequent nonobstructive apnea. Ultrasound cranium was normal in all neonates. MRI changes were noted in 3 neonates, and all had axial hypotonia, which persisted even on the day of discharge.

Discussion

Neonatal Chikungunya is mainly encountered during the outbreak, and perinatal infection is more frequent than acquired.[3] The first vertically transmitted neonatal Chikungunya was reported in La Réunion Island during 2005 to 2006.[2] In this case series, 4 out of 5 cases had vertical transmission confirmed by serum IgM and PCR for Chikungunya in both the mother and newborn. In a study conducted by Ramful et al,[2] 36 out of 38 neonates were confirmed to have vertical transmission, which became symptomatic within a week after birth.[2] In the first case, we suspected dengue virus infection instead of Chikungunya because of the endemicity of the disease. The usual incubation period of the CHIKV is 2 to 12 days; hence, we included only those symptomatic babies within the first 14 days of life. We also noticed that 4 out of 5 babies had apnea which was similar to Rao et al.[4] The

Table 1. Clinical Profile and Neuroradiological Finding.

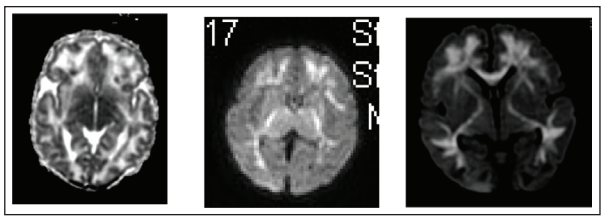
	Maternal Fever	Mother PCR	Baby PCR	Gestational Age	Birth Weight	Presentation (Day of Life)	Apnea	MRI Brain	Finding at Discharge
Case 1	+	Positive	Positive	38 weeks	2,900 g	5th DOL	+	Abnormal	Assisted feeding Axial hypotonia
Case 2	+	Positive	Positive	37 weeks	2,877 g	4th DOL	+	Abnormal	Assisted feeding Axial hypotonia
Case 3	−	Negative	Positive	39 weeks	3,100 g	14th DOL	+	Normal	Assisted feeding Axial Hypotonia
Case 4	+	Positive	Positive	38 weeks	2,800 g	5th DOL	−	Abnormal	Normal
Case 5	+	positive	Positive	38 weeks	2,750 g	3rd DOL	+	Normal	Normal

Source

Table 2. Clinical and Laboratory Findings.

Clinical Features n (%)		Laboratory Investigations n (%)	
Symptoms	n (%)	Positive blood culture	0 (0%)
Fever	5 (100%)	CSF hypoglycorrhachia	3 (60%)
Refusal of feeds	3 (60%)	CRP >20 mg/L	2 (40%)
Lethargy	2 (40%)	Thrombocytopenia	3 (60%)
Convulsions	4 (80%)	Serum IgM and PCR	5 (100%)
Apnea	4 (80%)	Dengue NS1 Antigen	0
Edema	3 (60%)		
Rash	3 (60%)		
Hyperpigmentation	3 (60%)		

Source:



AQ: 1 **Figure 1.** MRI Brain: Patchy area of bright signal on DW images without obvious restricted diffusion on ADC in the subcortical white matter of both cerebral hemispheres predominantly in the fronto-parietal lobes & diffuse altered signals involving bilateral cerebral hemispheres white matter, internal & external capsules.

AQ: 2 **Source:**

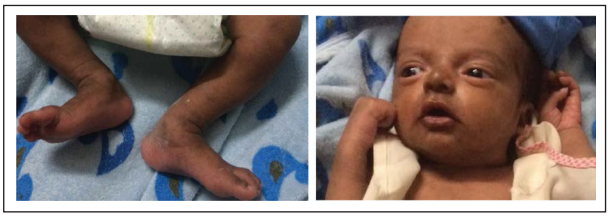


Figure 2. Hyperpigmentation over Upper Lip, Nose, and Diffuse Pigmentation over Skin.

Source:

maculopapular rash was present in 60% of neonates, including periorbital hyperpigmentation, which was again consistent with results published by Maria et al.[3] All the neonates presented with encephalopathy, and 80% had convulsions. A study conducted by Singh et al[5] reported hyperintensity of the splenium of the corpus callosum in T2/fluid-attenuated inversion recovery with restricted diffusion. Subtly altered signal in bilateral frontal deep white matter was seen on diffusion-weighted MRI. We also found MRI changes in 3 out of 5 neonates in the form of patchy areas of bright signal on diffusion-weighted MRI images. Diffuse altered signs were noticed involving bilateral cerebral hemispheres, white matter, internal, and external capsules.

Conclusion

Perinatal chikungunya encephalopathy with apnea in a term neonate is not very common; however, it must be suspected during seasonal outbreaks. Presently, there is no convincing evidence of subsequent neurocognitive impairment. Thus, long-term neurodevelopmental follow-up is needed for early intervention in neonates diagnosed with Chikungunya to achieve a better outcome.

Author Contributions

KA, SC, AP: diagnosis and management; SB, KA, SC, AP: All have contributed to the manuscript preparation and its approval.

Declaration of Conflicting Interests

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ORCID iD

Kumar Ankur https://orcid.org/0000-0002-2099-9398

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