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A Case Report of Chikungunya Neonatal Infection by Vertical Transmission in Cambodia

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Abstract

Introduction: Neonatal infection due to Chikungunya virus (CHIKV) was first described in the Outbreak in La Réunion Island in 2005, with the rate of vertical transmission of 48.7% in case of intrapartum viremia. All babies were asymptomatic at birth. Some severe complications were reported such as encephalopathy and hemorrhagic fever.

Objective: To describe the clinical and laboratory finding of the first neonate in Cambodia, serologically positive with CHIKV virus, from vertical transmission.

Clinical case: A term, small-for-gestational-age, male neonate was re-admitted for isolated high-grade fever at D4 of life and later confirmed with PCR for CHIKV. The mother had flu-like syndrome and skin rash few days before delivery.

Conclusion: CHIKV neonatal infection might be under-diagnosed in our country and even overlooked during Covid season. It is not a common differential diagnosis and the confirmatory test is not routinely done due to its price. This case report suggests considering CHIKV perinatal infection in febrile neonate, born to mother coming from a high-risk region for mosquito-borne diseases (Dengue regions) and presenting with fever and other flu-like symptoms prior to delivery.

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Introduction

Chikungunya is a mosquito-borne viral infection caused by Chikungunya virus (CHIKV), in the genus Alphavirus of Togaviridae family and it is transmitted by the same mosquito vectors as dengue: *Aedes aegypti* and *Aedes albopictus* [1].

The RNA virus was first discovered in a febrile patient in 1952 in Tanzania, a country in the East African country [2]. CHIKV has caused many outbreaks in Asia and South African. The major outbreak hit Kenya in 2004 and La Réunion, an overseas department of France, in 2005-2006 with about 266,000 cases [3].

Acute infection is characterized by sudden onset of fever, then myalgia, arthralgia, together with headache, photophobia and skin rash. Spontaneous resolution is within 1 to 2 weeks [4]. Neurological complications are more common in pediatric populations such as febrile seizure, encephalitis and acute encephalopathies [5].

Clinical manifestation of neonatal infection, laboratory findings and the rate of vertical transmission were first described during the outbreak of La Réunion in 2005 [6].

In Cambodia, the first cluster of Chikungunya was reported in 1961 and in 2012, there was an outbreak in a village in Kompong Speu Province where 44.7% of villagers (about 190 people)

were tested positive [7,8]. However, there was no case report of newborn infected by CHIKV neither any case of vertical transmission.

The objective of this report is to demonstrate the clinical and laboratory findings of the first serologically confirmed case of Chikungunya infection in a newborn, born at Calmette hospital (the only level III NICU in Cambodia) and infected during pregnancy from a mother coming from a high-risk province of mosquito-borne infection, with typical signs/symptoms of CHIKV infection.

Case Report

A boy, 4-day-old, was re-admitted to our Neonatal ICU Ward for isolated high-grade fever (T 38.7 at admission).

The boy, term of 38 WGA and 5 days, small-for-gestational-age, was born, by vaginal delivery. Amniotic fluid was green. No

Table 1: Laboratory findings during hospitalization.

	Hb (13-17g/dL)	WBC (4-9Giga/L)	Neutrophils (1.5-7.5Giga/L)	Lymphocytes (1-4Giga/L)	Platelets (150-450Giga/L)	CRP (<5mg/L)
28/11/20 (D2 of life)	16.2	13.6	7.46 (55%)	3.91 (29%)	227	3.7
30/11/20 (D4)	16.2	15.87	13.63 (85.8%)	1.28 (8.1%)	120	16.3
03/12/20 (D7)	14.5	16.39	8.53 (52%)	6.07 (37%)	94	7.9

nuchal cord. Good adaptation at birth with apgar 8, 9, 10 at M1, M5 and M10, respectively. Measurement at birth: Birth Weight 2600g (8e percentile, based on Audipog curves), Length 49cm (47e percentile) and Head Circumference 34cm (41e percentile).

He was born at our hospital to a mother, 26-year-old, gravida 2 para 1. The mother had no particular past medical history and no pregnancy-related complications. The antenatal care was done at a private clinic in her province. 3 days before admission, she had developed moderate fever (38-38.5) with headache, myalgia, arthralgia and then skin rash, which were conservatively treated at home.

At admission, she got high-grade fever (39°C) and was treated for Unspecified Fever during pregnancy with Ceftriaxone and Gentamicin. The investigations showed: Hb 11.8 g/dL (N 12-16), WBC 11.7 Giga/L (N 4-9) with PN 10.5 Giga/L (N 1.5-7.5) and lymphocyte 0.81 Giga/L (N 1-4), CRP 15.65 mg/L (N <5), UE within normal range, dengue serology negative, hemoculture sterile. With her geographic background, PCR Chikungunya was done at D3 of admission and was reported positive 2 days later. Her fever decreased at D4 of admission (thus D7 of the disease) while mild arthralgia persisted.

With amniotic fluid color and maternal fever; following our local guideline, the boy was treated with Ampicillin and Gentamicin for Suspected Neonatal Sepsis. After 48h, the clinical examination was unremarkable and the investigation was normal as in Table 1: Hb 16.2g/dL, WBC 13.6 Giga/L with PN 7.46 Giga/L (N 1.5-7.5) and Lympho 3.91 Giga/L (N 1-4), platelets 227 Giga/L (N 150-450), CRP negative and hemoculture negative. The boy was discharged to maternal ward with mother.

At D4 of life, the boy was re-admitted to NICU ward for isolated high-grade fever (38.7), responding well to paracetamol. Physical examination on the admission was unremarkable. The boy was irritable but calmed by breastfeeding; good sucking, rose and good muscle tone. Vital signs were stable; fontanelle not bulging, lungs clear, sinus tachycardia (due to fever), no hepatosplenomegaly, abdomen mildly bloated, but soft, not painful, bowel sounds audible.

The empiric antibiotic treatment was started with Cefotaxime (100mg/kg/day) and Amikacin (15mg/kg/day). Initial investigations showed as in **Table 1**: Hb 16.2 g/dL, WBC 15.8 Giga/L (Neutrophils 13.6 Giga/L, Lymphocytes 1.28 Giga/L), platelets 120 Giga/L, CRP 16.3 mg/dL; serum Na 134 mmol/L (N 135-148), serum bilirubin 112 mg/L (N 1-12), calcium 77 mg/L (N 86-103).

With antenatal maternal fever and background from a geographic high-risk region (Koh Kong province, a coastline, filled with

mountains and forests, one of the high-risk endemic region of Dengue): PCR Chikungunya was requested.

The infected boy was afebrile after 24h of admission; antibiotics stopped at 48h after the hemoculture was proven negative and CHIKV PCR was confirmed. Blood results before discharge showed Hb 14.5 g/dL, WBC 16.39 Giga/L, platelets 94 Giga/L, CRP 7.9 mg/dL and calcium 105. No fever, no bleeding signs, the boy was discharged at D3 after admission.

Discussion

CHIKV transmission from mother to child was first described in La Réunion by Professor Patrick Gérardin and his team [6] with the rate of 48.7%. All babies in the study were delivered near term with mean length of gestation of 38 weeks. The possible pathogenesis might be the contact between viremic maternal blood and the placenta lesions during each uterine contraction. In our case, the baby boy was delivered at 38 weeks of gestational age and 5 days; the transmission might occur mostly during the labor.

The transmission might not occur during passage in birth canal as it was shown that C-section has no influence on the virus transmission. The transmission is more likely not due to mosquito bite during early life because of the early onset of fever at D4 and because there was no mark of mosquito bite.

In our report, the clinical and laboratory findings correlate with the findings during the outbreak in La Reunion [6]. Our case had fever, with onset at D4. In their prospective study, all 19 infected newborns were asymptomatic at birth and fever was all present (100%) with the mean onset at D4 of life. However, in our case, there were no other symptoms such as joint pain or rash.

Our laboratory finding showed a decrease of lymphocytes count from 3.91 Giga/L at D2 of life to 1.28 Giga/L at D4 of life, the day of the admission. There was also a mild thrombocytopenia, without bleeding signs (platelets 120 Giga/L at admission). In La Reunion, thrombocytopenia was 89.4%, in which 47.3% were severe and lymphopenia was recorded 68.4%.

Lumbar puncture was not done in our case as the child was clinically non-toxic and fever responded well with antipyretics. However, severe complications were observed in 52.6% of the 19 French infected neonates, in which encephalopathy represented 90%. We should do lumbar puncture for our future case.

The diagnosis of chikungunya is based on the detection of virus by PCR or positivity of the virus serology Ig M/Ig G. However, the CHIKV IgM is positive mostly after D5 of infection then persisted for several months [9]. Thus as the treatment is only supportive and the onset was early (at D4 of life), to be economical, we requested only PCR.

Conclusion

Chikungunya rate of mother-child transmission is high (48.7% in viremic state). Although not well documented or mis-diagnosis, the diagnosis tests should be considered in newborns born to mothers, with onset of fever near delivery time and with history of coming from mosquito-borne diseases regions as in dengue demographic map.

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