

## Multifaceted chikungunya infection in infants - A case series

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### ABSTRACT

Chikungunya is an epidemic viral disease. It is known to cause explosive outbreaks after disappearing for several years. The clinical manifestations among infants are entirely different as compared to adults and older children. It can go undiagnosed in the garb of sepsis unless strong clinical suspicion is present. We report a series of infants presenting with neurological, circulatory, and cutaneous manifestations.

**Key words:** Chikungunya, Infants, Meningoencephalitis, Transaminitis

Febrile illness is one of the most common reasons for seeking medical attention among infants. In developing countries, viral diseases are not given due recognition among hospitalized infants due to high fatality rate of bacterial infections and lack of diagnostic facilities for viral diseases in the majority of the health facilities. Chikungunya is an epidemic viral disease caused by chikungunya virus belonging to genus Alpha virus of *Toga viridae* family. *Aedes aegypti* and *Aedes albopictus* are the primary vectors. It was first detected in 1952 in Africa followed by Asia in 1958 (Thailand) and has resurfaced in India in the last 10 years (2005-2016). Fever, crippling joint pains and rashes are commonly reported in chikungunya [1-3]. Severe manifestations are usually not reported till recently [4]. We report varied dissimilar and severe manifestations of chikungunya infection among infants during the recent outbreak in the national capital.

### CASE REPORT

#### Case 1

A 6-month-old male child presented with fever for 1 day followed by appearance of a generalised erythematous rash on day 2, which progressed to fluid filled cutaneous lesions in 24 hours. He had an uneventful natal and postnatal course. At admission, he was febrile (102°F), active with ruptured bullae, and erosions involving anterior abdomen, gluteal region and both lower and upper limbs sparing the face and oral cavity. Rest of the systemic examination was normal. There was evidence of neutrophilic leukocytosis (total leukocyte count [TLC] - 10,200/mm<sup>3</sup>, polymorphs - 70%, platelet count - 180,000/mm<sup>3</sup>), C- reactive protein (CRP) was elevated (1.94 mg/dl) with mild transaminitis (AST/ALT- 125/48 IU). The child was managed as staphylococcal scalded skin

syndrome (SSSS). However, the throat swab, blood culture, urine, and bleb cultures were sterile. Chikungunya serology MAC ELISA Mac Elisa was positive on day 6 of illness. Dengue NS-1 and serology were negative. He became afebrile at day 7 of illness and rash healed with sloughing and hyperpigmentation by day 14 (Fig. 1). Chikungunya IgG for rising titers was not considered on follow-up as the baby remained well.

#### Case 2

A 3-month-old female child presented with fever and loose stools for 5 days associated with large fluid filled cutaneous lesions and oral ulcers for 3 days. The child had an uneventful birth history with no past hospital admissions. On examination, she was febrile (101.4°F), had multiple dusky red papules, discrete as well as coalescing to form plaques over both upper and lower limbs sparing the face and trunk along with oral ulcers. The patient had TLC of 6800/mm<sup>3</sup> with polymorphs 50%. CRP and blood culture were negative. Her platelet count was 100,000/mm<sup>3</sup> that dipped further to 90,000/mm<sup>3</sup> during the course of stay along with raised transaminases (AST/ALT- 123/75 IU) which normalized subsequently. Chikungunya serology for IgM was positive and dengue serology was negative on day 8. The skin lesions healed with hypopigmentation and infant was subsequently discharged.

#### Case 3

A 1-month-old female child presented with fever, fast breathing, and poor feeding for 1 day along with one episode of vomiting. The child had uneventful antenatal and postnatal course. At admission, the child was febrile, irritable, had generalized confluent erythematous rash along with peripheral mottling, acrocyanosis, and capillary refill time (CRT) more than 3 seconds.



**Figure 1: A six month-old infant with peeling lesions over buttocks and lower limbs along with hyperpigmentation**



**Figure 2: A two month-old infant with residual hyperpigmentation and scarring**

She also had an episode of seizure during high fever (103°F). The most plausible diagnosis of sepsis was considered. Laboratory investigations revealed TLC - 9300/mm<sup>3</sup> with polymorphs of 63% and high CRP (3.1 mg/dl) and transaminitis (AST/ALT - 163/59 IU). Metabolic screen and cultures were negative. Cerebrospinal fluid (CSF) analysis was normal. Mottling and CRT improved after fluids and inotropic support for 24 hours. Rash disappeared by day 6. Chikungunya and dengue serology done at day 6 of illness was positive for chikungunya and ruled out dengue. The infant was discharged without any neurological deficit.

#### Case 4

A 2-month-old male child presented with fever and rash for 2 days and one episode of uprolling of eyes with tonic posturing at the peak of fever. On examination, he was febrile, had erythematous maculopapular rash over face, trunk, and all four limbs. The child had uneventful birth and postnatal course. Metabolic and sepsis workup were negative. CSF analysis was suggestive of viral meningitis (cytology - 60 cells with 96% lymphocytes, proteins - 112 mg/l and sugar - 58 mg/dl). He had raised transaminases (ALT/AST -115/126). Chikungunya serology done at day 5 was positive for IgM antibodies. Ultrasound cranium was normal. He had no further seizures and was discharged after 7 days with residual hyper pigmentation mimicking post-measles scarring (Fig. 2). His mother was asymptomatic in the antenatal and post-natal period. She became symptomatic with fever, vomiting, and joint pains after child's admission. She was found to have IgM chikungunya antibody positive. Ig G negative. NS-1 was negative.

#### DISCUSSION

Chikungunya virus is maintained in the human population by human-mosquito-human transmission. Aedes mosquitoes are day biters and breed in domestic containers holding water. Lack of herd immunity and various environmental factors can

lead to large outbreak among infants and younger children. Rate of chikungunya detection is nearly similar between Elisa and reverse transcription-polymerase chain reaction (RT-PCR). RT-PCR assays have been found to be more sensitive till first 4 days of fever onset, after which serology is found to be more effective in diagnosis [5]. Clinical manifestations among infants in our case series are entirely different as compared to adults and older children. Chikungunya can go under diagnosed in the garb of sepsis unless strong clinical suspicion is present.

Case 1 and 2 presented with vesiculobullous lesions mimicking SSSS. In both infants, there was no history of drug intake and rash appeared on day 2 of fever and healed by 14 days with hyperpigmentation unlike typical occurrence on 4<sup>th</sup> day as described in literature. Oral ulcer is also a rare manifestation. In SSSS, facial involvement is an early presentation with a prodrome of conjunctivitis and sore throat, while in chikungunya rashes usually spare the face and heal with hyperpigmentation [6]. These two cases highlight the need of suspecting chikungunya in infants with febrile vesiculobullous eruptions, especially in monsoon season, for more rational use of antibiotics and preventing unnecessary prolonged hospital stay.

Case 3 presented with acrocyanosis, mottling, and poor peripheral perfusion. Septic shock has been reported in adults but in infants, there is paucity of data regarding such severe presentation [7-9]. We ruled out dengue and sepsis in our patient. This undermines the fact that chikungunya infection is not life-threatening. Case 4 presented with meningitis and rash. There was recovery without any neurological sequelae and rashes healed with hyperpigmentation. The neurologic manifestations reported in adults and children include meningoencephalitis, seizures, and even Guillain-Barre syndrome [10,11].

All the infants had a normal leukocyte count with neutrophilia unlike the typical pattern of leukopenia with lymphocyte predominance in viral infections. CRP was also raised in two out of four infants. They all had transaminitis with normal bilirubin which normalized by 2<sup>nd</sup> week indicating a transient nature (Table 1). There is evidence of deranged liver enzyme caused by chikungunya in adults but in infants, it is rare [12,13]. Cross

Table 1: Clinical and biochemical profile of individual cases.

Case number	Age(months)/sex	Predominant clinical manifestation	Total leukocyte count (cu/mm)	Liver enzymes (SGOT/SGPT)	Outcome
1	6/M	Vesiculobullous rash	10200	125/48 IU	Recovered
2	3/F	Vesiculobullous rash	6800	123/75 IU	Recovered
3	1/F	Shock	9300	163/59 IU	Recovered
4	2/M	Meningoencephalitis	8400	126/115 IU	Recovered

SGOT/SGPT: Serum glutamic oxalocetic transaminase/serum glutamic pyruvic transaminase

reactivity between dengue and chikungunya virus antibodies may pose diagnostic challenge, but high titers of chikungunya are known to mitigate this cross reactivity [14,15]. All infants had high chikungunya titres plus dengue was ruled out by both NS-1 and serology.

## CONCLUSION

Chikungunya in infants can present with protean manifestations. It is imperative to consider chikungunya infection among infants presenting with cutaneous or neurological manifestations, especially during the monsoon and post monsoon season. Timely diagnosis can prevent irrational antibiotic use. From preventive point of view, advice to use mosquito nets even during day time sleep of infants should be encouraged.

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