

Chikungunya infection, which again reminds of the Zika virus. Traditionally Chikungunya virus is thought to be mild neurotropic but current series contradict this hypothesis as all were having neurological features at presentation and two-thirds had persistent radiological findings. As highlighted by Dr. John in his editorial [2], both Chikungunya and Zika virus are transmitted by the same mosquito; and many times co-exists. Also, their coexistence may increase the virulence of each other. A recently published study showed that there is a strong significant correlation between the distribution of infection-related microcephaly and Chikungunya infection rate [5]. Therefore, it may be worthwhile to re-examine the birth/admission head circumference of the enrolled neonates for assessment of microcephaly and to look for an association, if any. Although, the number is small but still it can point towards a new hypothesis and may help in understanding the relation between microcephaly, poverty and co-infection of Zika, Chikungunya and other arboviruses.

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REFERENCES

1. Maria A, Vallamkonda N, Shukla A, Bhatt A, Sachdev N. Encephalitic presentation of neonatal Chikungunya: A case series. *Indian Pediatr.* 2018;55: 671-4.
2. John TJ. Neonatal chikungunya: Spotlight on gaps in public health. *Indian Pediatr.* 2018;55:659-60.
3. Neonatal Encephalopathy and Neurologic Outcome, Second Edition. *Pediatrics.* 2014;133:e1482-8.
4. Evidence-Based Clinical Practice Guidelines. National Neonatology Forum, India; 2010. Available from: babathakranwala.in/IAP-neo-chap/uploads/acd-corner/nmf_guidelines-2011.pdf. Accessed August 18, 2018.
5. Campos MC, Dombrowski JG, Phelan J, Marinho CRF, Hibberd M, Clark TG, *et al.* Zika might not be acting alone: Using an ecological study approach to investigate potential co-acting risk factors for an unusual pattern of microcephaly in Brazil. *PLoS One.* 2018;13:e0201452.

AUTHORS' REPLY

1. All neonates in the case series [1] were of gestation between 36 to 38 weeks. The definition of neonatal encephalopathy (mentioned in Table I of our article) in our series matched that given by American Academy of Pediatrics [2].
2. The cut-offs of biochemical tests were not arbitrary but taken from Avery's textbook of Neonatology 7th

edition (also indicated in Table I of our article). National Neonatology Forum (NNF) criteria would have led to underdiagnosis and missing out of seven cases. Also, NNF definition states that "there is no safe cut-off at which one can recommend do not treat. Clinical judgment would have to be used." This highlights the limitations in deciding on any set cut-off values to diagnose hypoglycorrhachia, pleocytosis and increased protein.

3. We thank the authors for pointing out an important observation. We had in fact mentioned a comparison of Chikungunya virus with Zika virus while writing this paper but the details had to be edited out due to word limit. The Centers for Disease Control and Prevention (CDC) case definition of congenital Zika virus disease prominently includes microcephaly as its first clinical criterion apart from others [3]. There is a strong association of microcephaly at birth with Zika virus infection *in utero*, especially if contacted in first trimester of pregnancy [4]. None of the babies in our study had microcephaly at birth. Our cases presented during a Chikungunya outbreak in the city. No transmission of Zika virus was reported during the same period as per government reports [5]. We agree to the proposition that provision for a panel of tests for arboviral infections, including Zika virus and Chikungunya virus, should be in place for neonates suspected to be having co-infection.

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REFERENCES

1. Maria A, Vallamkonda N, Shukla A, Bhatt A, Sachdev N. Encephalitic presentation of neonatal Chikungunya: A case series. *Indian Pediatr.* 2018;55: 671-4.
2. Neonatal encephalopathy and neurologic outcome, Second Edition. *Pediatrics.* 2014;133:e1482-8.
3. Zika virus disease and zika virus infection. Centers for disease control and prevention 2016 case definition. Available from: <https://www.cdc.gov/nndss/conditions/zika/case-definition/2016/06/>. Accessed September 01, 2018.
4. de Araújo TVB, Ximenes RAA, Miranda-Filho DB, Souza WV, Montarroyos UR, de Melo APL, *et al.* Association between microcephaly, Zika virus infection, and other risk factors in Brazil: Final report of a case-control study. *Lancet Infect Dis.* 2018;18:328-36.
5. Press note on Zika virus disease. Press Information Bureau, Government of India, Ministry of Health and Family Welfare. Available from: http://www.searo.who.int/india/mediacentre/news/press_note_zika_virus_disease.pdf. Accessed September 05, 2018.