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Zika virus-associated seizures

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To the Editor,

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Recently, a few review articles have been published on Zika virus discussing many aspects of Zika virus infection eloquently; however, they did not mention the evidence on Zika virus-associated seizures [1, 2]. The potential for worldwide Zika virus spread is large [1, 2]. About 80% of people infected by Zika virus appear to be without symptoms. When symptoms occur, they are described as "dengue-like". Zika virus has a strong neurotropism [1-3]. Zika virus may impair growth in cerebral organoids from human embryonic stem cells by targeting neural progenitors [4]. It may cause dysregulation of the genes involved in neurogenesis [4]. Association between maternal Zika virus infection and infantile microcephaly has been reported [1-3]. In a series of 35 infants with Zika-associated microcephaly, neurological abnormalities (other than microcephaly) were reported in 49% of the cases, including hypertonia/ spasticity (37%) and seizures (9%). In that series, neuroimaging was available in 27 patients and it was abnormal in all of them. Widespread brain calcifications and evidence of cell migration abnormalities (e.g., lissencephaly, pachygyria) were reported [5]. In one publication, the authors reported encephalopathy and seizure in a patient with Zika virus infection [6]. That patient was a previously healthy young adult who was admitted after experiencing an episode of convulsion that occurred six hours after the onset of a dengue-like illness. When admitted, the patient had a low level of consciousness. After intravenous injection of clonazepam, the patient recovered to a normal level of consciousness. Laboratory findings at the onset of symptoms showed normal cerebro-spinal fluid analyses. Brain magnetic resonance imaging (MRI) and electroencephalogram (EEG) performed five days after the onset of the neurological symptoms, were normal. Zika virus was detected by real-time RT-PCR in plasma, CSF and urine, while all other etiologies were ruled out [6].

In brief, awareness of the various neurological complications associated with Zika virus infection both in infected patients and also in the offspring of infected pregnant women is needed to treat and follow the patients living in regions affected by this infection and also for the travelers to these regions. Considering the very large scale of the current pandemic and the potentially serious consequences of Zika virus infection, the impact of this virus could be significant. This highlights the need for a fast and robust global response to limit its impact through the development of better preventative, diagnostic, and therapeutic approaches.

Conflicts of interest

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References

1. Araujo AQ, Silva MT, Araujo AP. Zika virus-associated neurological disorders: a review. Brain 2016; 139(Pt 8): 2122-30.
2. Boeuf P, Drummer HE, Richards JS, Scoullar MJ, Beeson JG. The global threat of Zika virus to pregnancy: epidemiology, clinical perspectives, mechanisms, and impact. BMC Med 2016; 14(1): 112.
3. Valentine G, Marquez L, Pammi M. Zika Virus-Associated Microcephaly and Eye Lesions in the Newborn. J Pediatric Infect Dis Soc 2016; 5(3): 323-8.
4. Dang J, Tiwari SK, Lichinchi G, Qin Y, Patil VS, Eroshkin AM, et al. Zika Virus Depletes Neural Progenitors in Human Cerebral Organoids through Activation of the Innate Immune Receptor TLR3. Cell Stem Cell 2016; 19(2): 258-65.
5. Schuler-Faccini L, Ribeiro EM, Feitosa IM, Horovitz DD, Cavalcanti DP, Pessoa A, et al; Brazilian Medical Genetics Society–Zika Embryopathy Task Force. Possible Association Between Zika Virus Infection and Microcephaly - Brazil, 2015. MMWR Morb Mortal Wkly Rep 2016 29; 65(3): 59-62.
6. Rozé B, Najioullah F, Signate A, Apetse K, Brouste Y, Gourgoudou S, et al; Neuro-Zika Working Group of Martinique. Zika virus detection in cerebrospinal fluid from two patients with encephalopathy, Martinique, February 2016. Euro Surveill 2016; 21(16). doi: 10.2807/1560-7917. ES.2016.21.16.30205.