



HOSTED BY



ELSEVIER

Contents lists available at ScienceDirect

Asian Pacific Journal of Tropical Medicine

journal homepage: <http://ees.elsevier.com/apjtm>Letter to the Editor <http://dx.doi.org/10.1016/j.apjtm.2016.10.004>

Based on the risk of dengue virus transmission via blood transfusion: What about the risk in case of Zika virus?

Somsri Wiwanitkit¹, Viroj Wiwanitkit²¹Wiwanitit House, Bangkhae, Bangkok, Thailand²Hainan Medical University, Haikou 571199, Hainan, China

Dear Editor,

Many pathogens can be transmitted via blood and blood product, which is a big concern in transfusion medicine. Focusing on the well-known tropical arbovirus infection, dengue infection, the transmission via blood transmission is not common but it is already confirmed for the possibility [1]. At present, the great concern is on Zika virus, a new emerging pathogen that is closely related to dengue virus [2]. The recent report from Brazil on a possible case of transfusion transmitted Zika virus infection [3] leads us to the new concern on the third possible mode of transmission of this problematic virus (adding to mosquito bite and sexual contact).

The safety of blood and blood product is the main concept in transfusion practice [4]. The screening for the virus is the new issue for discussion in the endemic area. In fact, in the endemic tropical areas the high seropositive rate of Zika virus can be observed. For example, in Cambodia, the recent report showed that the seropositive rate was more than 50% [5]. However, there is still no report on the rate of viral contamination. A recent report from South America has mentioned the history screening for febrile illness but this is usually problematic in transfusion medicine practice. For Zika virus infection, asymptomatic infection is common and this can be the big risk [6]. To estimate the risk of Zika virus transmission via blood transmission is very interesting and can be useful.

This can be done by mathematical modeling technique using the data of case of similar problematic virus. Here, the authors perform such study using the data on dengue virus in the previous study as model. In fact, the screening for dengue is performed in many big blood bank in tropical Asia and the recent report from India showed null prevalence [7]. However, that study uses non-structural antigen (NS1) test as tool for

screening [7]. In a recent report, it is found that “NS1–Ag detected 20% of all RNA confirmed-positive donations” [8]. Hence, it can be assumed that there are 80% missed diagnosed cases [8]. In a recent report from Brazil, Dias *et al.* used RNA test for screening and found that 0.4% of healthy non-febrile blood donor were positive for dengue RNA [9]. According to Wikan *et al.* [10], 13 out of 17 dengue immunoreactive cases have immunoreactive to Zika virus, which implies that 76.5% of dengue positive case might be Zika virus positive. Also, Wikan *et al.* [10] found that 13 out of 16 Zika virus immunoreactive cases have immunoreactive to dengue virus, which implies that if we find common positive for Zika virus in dengue virus positive case, the detected number of Zika virus positive is only 81.3% of the actual number or 18.7% is missed.

Using a mathematical principle and based on the described data by Wikan *et al.* [10], we can assume that if there are 1000 dengue positive cases, there should be as many as 952 Zika virus positive cases (765 common cases that can be detected by test and 187 missed cases). Hence, the possible highest rate of Zika virus positive in scenario of having dengue positive case should be 95.2%. Based in the report from Brazil that 0.4% of donated blood are positive for dengue virus, there can be up to 0.384 8% for Zika virus. Hence, the calculated rate can be the value to be mentioned for risk of Zika virus transmission via blood transfusion. The observed rate is similar high to dengue and this means it is apparently that blood transfusion is a possible mode of Zika virus transmission and there is a need to have a system to have a model laboratory screening for Zika virus in blood bank.

Conflict of interest statement

We declare that we have no conflict of interest.

✉First and corresponding author: Somsri Wiwanitkit, Wiwanitkit House, Bangkhae, Bangkok, Thailand.

E-mail: somsriwivan@hotmail.com

Peer review under responsibility of Hainan Medical University.

Article history:

Received 6 Aug 2016

Received in revised form 7 Sep 2016

Accepted 7 Oct 2016

Available online 3 Nov 2016

References

- [1] Wiwanitkit V. Unusual mode of transmission of dengue. *J Infect Dev Ctries* 2009; **3**(4): 51-54.
- [2] Wiwanitkit S, Wiwanitkit V. Acute viral hemorrhage disease: a summary on new viruses. *J Acute Dis* 2015; **4**(4): 277-279.
- [3] Barjas-Castro ML, Angerami RN, Cunha MS, Suzuki A, Nogueira JS, Rocco IM, et al. Probable transfusion-transmitted Zika virus in Brazil. *Transfusion* 2016; **56**(7): 1684-1688.
- [4] Kuehnert MJ, Basavaraju SV, Moseley RR, Pate LL, Galel SA, Williamson PC, et al. Screening of blood donations for Zika virus infection – Puerto Rico, April 3-June 11, 2016. *MMWR Morb Mortal Wkly Rep* 2016; **65**(24): 627-628.
- [5] Wiwanitkit S, Wiwanitkit V. Afebrile, asymptomatic and non-thrombocytopenic Zika virus infection: don't miss it! *Asian Pac J Trop Med* 2016; **9**(5): 513.
- [6] San K, Rajadhan V. Seroprevalence of Zika virus in Cambodia: a preliminary report. *Adv Lab Med Int* 2016; **6**(3): 37-40.
- [7] Mangwana S. Dengue viremia in blood donors in Northern India: challenges of emerging dengue outbreaks to blood transfusion safety. *Asian J Transfus Sci* 2015; **9**(2): 177-180.
- [8] Matos D, Tomashek KM, Perez-Padilla J, Muñoz-Jordán J, Hunsperger E, Horiuchi K, et al. Probable and possible transfusion-transmitted dengue associated with NS1 antigen-negative but RNA confirmed-positive red blood cells. *Transfusion* 2016; **56**(1): 215-222.
- [9] Dias LL, Amarilla AA, Poloni TR, Covas DT, Aquino VH, Figueiredo LT. Detection of dengue virus in sera of Brazilian blood donors. *Transfusion* 2012; **52**(8): 1667-1671.
- [10] Wikan N, Suputtamongkol Y, Yoksan S, Smith DR, Auewarakul P. Immunological evidence of Zika virus transmission in Thailand. *Asian Pac J Trop Med* 2016; **9**(2): 141-144.