Probability of the Temporary Acquired Chikungunya Virus Infection in Non-immune Travelers Returning from an Epidemic Activity Destination at Songkhla Province in Southern Thailand during 2008-2014

Hatsadee Appassakij[1*], Paiwan Khuntikij[2], Pairaya Rujirojindakul[2], Charuporn Promwong[3], Khachornsakdi Silpapojakul[4]

[1.] Department of Pathology, Faculty of Medicine, Prince of Songkla University, [2.] Department of Pathology, Faculty of Medicine, Prince of Songkla University, [3.] Sanpasitthiprasong Hospital, Ubon Ratchathani, [4.] Department of Medicine, Faculty of Medicine, Prince of Songkla University

Background/Objective

Chikungunya virus (CHIKV) has been responsible for huge periodic epidemics in both endemic and previously non-endemic areas where competent mosquitoes are present. Therefore, the impact of CHIKV infection on autochthonous transmission in non-endemic areas via travelers visiting the epidemic activity destinations needs to be a concern. This study highlighted the probability of CHIKV-infected travelers who temporarily visited the largest epidemic activity destination in southern Thailand.

Method

A mathematical model named the "European Up-Front Risk Assessment Tool (EUFRAT)" was used to predict the probability of the travelers acquiring CHIKV infection who visited the largest epidemic activity destination at Songkhla Province in southern Thailand, during 2008-2014.

Result

An analysis of data over the 7-year period of 2008-2014, in general, the estimated risks of travelers acquiring infection considerably varied by visited year, seasonality, duration of stay, and time since last exposure. Specifically, the risk of Thai inhabitants acquiring infection per 100,000 was estimated to be 154.0 (95% confidence interval (CI); 135.7-172.3) in the 2009 epidemic year and from 0 to 1.2 (95% CI; 0.4-2.0) in the non-epidemic years. Given that, in the 2009 epidemic year, the travelers stayed in the affected destination for 7 days and time since last exposure risk was 0, 5 or 10 days, such risks to travelers were reduced to be as low as 113.5 (95%CI; 97.8-129.2); 73.0 (95% CI; 60.4-85.6), or 0.0; respectively.

Conclusion

The interventions for preventive measures (e.g. pre-travel advise including epidemic activity, use of insect repellents) and blood safety measures should be promptly applied to "risky" travelers to prevent the CHIKV infection threats in their home regions. This study also suggests the predonation screening for possible CHIKV exposure and the deferral of blood donations for at least 10 days to prevent the transfusion-associated CHIKV infection risk from "risky" blood donor.