

## LETTERS

### The authors respond to “Is there a real increased risk of stroke in patients with dengue fever?”

My coauthors and I thank Drs. Joob and Wiwanitkit<sup>1</sup> for sharing their experience regarding our recent study.<sup>2</sup> We agree that stroke is an uncommon neurologic complication in patients with dengue fever.

As shown in our study, the overall incidence rate of stroke in the dengue cohort was 5.33 per 1000 person-years, with an adjusted hazard ratio (HR) of 1.16 (95% confidence interval [CI] 1.01–1.32) compared with the control cohort. Interestingly, we found the stroke risk in dengue patients was time-dependent, as high as 25.53 per 1000 person-years (adjusted HR 2.49, 95% CI 1.48–4.18) in the first two months. The increased risk of stroke in dengue patients was not only for hemorrhagic stroke, but also for ischemic stroke. This may be owing to the universal screening and surveillance

program of dengue established by the Centers for Disease Control, R.O.C. (known as the Taiwan CDC) and the easy accessibility of medical care in Taiwan, improving the early detection of ischemic stroke in patients with dengue fever. In a review, Carod-Artal and colleagues also assumed that cases of ischemic stroke related to dengue might be underestimated in dengue-endemic countries.<sup>3</sup>

The concern about the association between ischemic stroke and dengue is critical for clinical practice in dengue-endemic areas. Because the treatments for acute ischemic stroke include administration of a thrombolytic agent and intraarterial thrombectomy, using these treatments in underdiagnosed dengue patients will increase the risk of intracranial hemorrhage and could lead to death.

To the best of our knowledge, this is the first study to report epidemiologic data on dengue-associated stroke at a national-population level, with a well-matched control group to adjust for age,

sex, stroke-related comorbidities and competing risk of death. We acknowledge that this study had several limitations, such as a lack of available laboratory data. However, it still provides a comprehensive overview of stroke risk in dengue patients and helps clinicians recognize the association for better practice.

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#### References

1. Joob B, Wiwanitkit V. Is there a real increased risk of stroke in patients with dengue fever? [letter]. *CMAJ* 2018;190:E940.
2. Li H-M, Huang Y-K, Su Y-C, et al. Risk of stroke in patients with dengue fever: a population-based cohort study. *CMAJ* 2018;190:E285-90.
3. Carod-Artal FJ, Wichmann O, Farrar J, et al. Neurological complications of dengue virus infection. *Lancet Neurol* 2013;12:906-19.

**Competing interests:** None declared.