

# Letter to the Editor

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## Letter by Zhao et al Regarding Article, “Misdiagnosis of Cerebral Vein Thrombosis in the Emergency Department”

To the Editor:

We read with great interest the recent study by Liberman et al,<sup>1</sup> investigating the rate of cerebral vein thrombosis (CVT) misdiagnosis and exploring whether CVT misdiagnosis was associated with adverse clinical outcomes. The authors identified 5966 patients with CVT in whom 216 (3.6%; 95% CI, 1.1%–4.1%) had probable CVT misdiagnosis. Probable CVT misdiagnosis was not associated with in-hospital mortality (0.14; 95% CI, 0.02–1.05), intracerebral hemorrhage (0.97; 95% CI, 0.57–1.65), or unfavorable discharge disposition (0.90; 95% CI, 0.61–1.32); but a longer length of hospital stay was seen among patients with probable CVT misdiagnosis (1.62; 95% CI, 1.04–2.50). A confirmatory study was performed in 134 patients with CVT in whom 8 patients were misdiagnosed with CVT (6.0%; 95% CI, 2.6%–11.4%), but probable CVT misdiagnosis was not associated with an unfavorable discharge Modified Rankin Scale.

We commend the authors for their work. However, a few of the results warrant closer inspection. The symptomatology of CVT can be explained by 2 pathophysiological mechanisms: thrombosis of the major cerebral venous sinuses and thrombosis of the cortical veins.<sup>2</sup> Occlusion of the major cerebral sinuses blocks the drainage of cerebrospinal fluid, which results in increased intracranial pressure and frequently presents with headache. Occlusion of cortical veins has frequently been demonstrated to cause parenchymal lesions and presents with seizures and neurological deficits. Therefore, the clinical manifestations of CVT vary among patients with different thrombosis locations. When comparing adverse clinical outcomes, it might be better to take the location of thrombosis into consideration. Additionally, in this study, a probable CVT misdiagnosis was made based on the occurrence of headache or seizure, whether the concurrent presence of neurological deficits or other clinical manifestations (eg, vomiting or vision loss) had influence on the diagnosis of CVT was not reported.

Furthermore, the likelihood of CVT misdiagnosis varies among patients with occlusion of cortical veins and cerebral sinuses; in patients with isolated cortical vein thrombosis, the diagnosis of CVT is more difficult, and some patients are only diagnosed at autopsy.<sup>3</sup> Liberman et al reported that only 216 cases had a probable CVT misdiagnosis. Further information on the location of thrombosis in these patients might be helpful for the understanding of the rate of CVT misdiagnosis.

Unlike those with arterial occlusion, most patients recover from CVT without physical disability, but many of them still experience residual chronic symptoms. Therefore, it might be not a good choice to use Modified Rankin Scale for the assessment of clinical prognosis in these patients. As the authors stated in the article, assessment of visual fields, visual acuity, and cognitive changes are needed. Additionally, previous studies found that ≈50% patients reported headache and 14% required bed rest or hospital admission because of severe headache.<sup>4</sup> Therefore, headache might also be useful to quantify the clinical effects of misdiagnosis.

Take all together, we would like to congratulate the authors for their meaningful study. However, we suggest further analysis of data based on the location of thrombosis and consideration of the concurrent presence of other manifestations. In addition to physical disability, headache should be assessed to quantify the clinical effects of misdiagnosis.

### Disclosures

None.

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