

# Disputes & Debates: Editors' Choice

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## Editors' Note: Microembolism and Other Links Between Migraine and Stroke: Clinical and Pathophysiologic Update

In "Microembolism and Other Links Between Migraine and Stroke: Clinical and Pathophysiologic Update," Sacco et al. reviewed the clinical and pathophysiologic relationship between migraine and stroke. Scutelnic et al. commented that it is important to recognize that (1) there are limited data on the clinical features of stroke in patients with migraine with aura; (2) migraine aura can change, and the difference between the change in aura and ischemic stroke is not clear; and (3) the relationship between atrial fibrillation and migraine, particularly as pertains to hypercoagulability, antithrombotics, and migraine prevention and treatment, is unclear. For the authors, Ornello et al. noted that although aura symptoms can change, clinical characteristics usually define the distinction between a typical migraine and migrainous infarction including persistent focal findings or neuroimaging evidence of an ischemic brain lesion in the appropriate territory responsible for 1 or more aura symptoms. They also agreed that the relationship between atrial fibrillation and migraine is complex but indicated that this relationship was outside the scope of their review.

Ariane Lewis, MD, and Steven Galetta, MD  
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## Reader Response: Microembolism and Other Links Between Migraine and Stroke: Clinical and Pathophysiologic Update

Adrian Scutelnic (Bern, Switzerland), Simon Jung (Bern, Switzerland), and Christoph J. Schankin (Bern, Switzerland)  
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We read with great interest the review by Sacco et al.<sup>1</sup> and generally agree with their findings. However, we would like to outline some limitations. First, the clinical description of symptoms of stroke compared with the habitual migraine aura is limited to 2 small series: Olesen et al.<sup>2</sup> reported 5 patients with previous MA and ischemic stroke, and Wolf et al.<sup>3</sup> took the symptoms of 11 patients solely from the charts. Therefore, we believe that more emphasis should be put on the lack of data on clinical features of stroke in patients with known migraine with aura.

Second, a change of aura symptoms might occur without it necessarily being a stroke, an issue of enormous clinical relevance that has not been covered by the review. Clinical features that help differentiate a nonstereotypical aura from an ischemic stroke are still unclear. This is of particular importance because even patients without a history of migraine with aura often report migraine-like symptoms during ischemic stroke.<sup>4</sup> Third, the complex association between atrial fibrillation and migraine has been a little oversimplified not covering issues, such as hypercoagulability, antithrombotics as migraine prevention therapy, and others.<sup>5</sup>

1. Sacco S, Harriott AM, Ayata C, et al. Microembolism and other links between migraine and stroke: clinical and pathophysiologic update. *Neurology*. 2023;100(15):716-726. doi. 10.1212/WNL.0000000000201699
2. Olesen J, Friberg L, Olsen TS, et al. Ischaemia-induced (symptomatic) migraine attacks may be more frequent than migraine-induced ischaemic insults. *Brain* 1993;116(Pt 1):187-202.
3. Wolf ME, Szabo K, Griebel M, et al. Clinical and MRI characteristics of acute migrainous infarction. *Neurology*. 2011;76(22):1911-1917.

Author disclosures are available upon request (journal@neurology.org).

4. Scutelnic A, Kreis LA, Beyeler M, et al. Migraine aura-like symptoms at onset of stroke and stroke-like symptoms in migraine with aura. *Front Neurol*. 2022;13:1004058.
5. Scutelnic A, Mattle HP, Branca M, et al. Migraine and atrial fibrillation: a systematic review. *Eur J Neurol*. 2022;29(3):910-920.

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## Author Response: Microembolism and Other Links Between Migraine and Stroke: Clinical and Pathophysiologic Update

Raffaele Ornello (L'Aquila, Italy), Luciano A. Sposato (London, Ontario), and Simona Sacco (L'Aquila, Italy)  
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We read with interest the comments by Scutelnic et al. on our Review article.<sup>1</sup> Their comments confirm the scientific community's ongoing interest in the association between vascular comorbidities and migraine. We agree with the comments of Dr. Scutelnic et al. regarding the clinical presentation of migrainous infarction. Migrainous infarction can present with migraine aura symptoms, but typical neurologic deficits ensue, leading to the diagnostic suggestion of an ischemic stroke.<sup>2</sup> Aura symptoms are transient, positive, and progressive while typical ischemic neurologic symptoms are negative and reach their maximum soon after the onset of a stroke or transient ischemic attack.<sup>3</sup> Differentiating migrainous infarction from usual migraine depends on the difference between aura and ischemic symptoms. We also agree that aura symptoms can change during life. Nevertheless, the clinical characteristics of ischemic and aura symptoms usually allow the differentiation between the 2 entities.<sup>4</sup> Finally, we recognize that the relationship between atrial fibrillation and migraine with aura is complex and can be either direct or indirect.<sup>5</sup> However, our review focused on microembolism and its role in migraine and stroke pathophysiology. Other associations between cardiac arrhythmias and stroke risk in patients with migraine were beyond this Review's scope.

1. Sacco S, Harriott AM, Ayata C, et al. Microembolism and other links between migraine and stroke: clinical and pathophysiologic update. *Neurology* 2023;100(15):716-726. doi. 10.1212/WNL.0000000000201699
2. Laurell K, Artto V, Bendtsen L, et al. Migrainous infarction: a Nordic multicenter study. *Eur J Neurol*. 2011;18(10):1220-1226.
3. Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition. *Cephalalgia*. 2018; 38(1):1-211. doi. 10.1177/0333102417738202
4. Lebedeva ER, Gurary NM, Gilev DV, Christensen AF, Olesen J. Explicit diagnostic criteria for transient ischemic attacks to differentiate it from migraine with aura. *Cephalalgia* 2018;38(8):1463-1470. doi. 10.1177/0333102417736901
5. Scutelnic A, Mattle HP, Branca M, et al. Migraine and atrial fibrillation: a systematic review. *Eur J Neurol*. 2022;29(3):910-920. doi: 10.1111/ene.15198

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