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Response to Letter Regarding Article, "Clinically confirmed stroke with negative diffusion-weighted imaging magnetic resonance imaging: longitudinal study of clinical outcomes, stroke recurrence, and systematic review"

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Keywords

Stroke; ischemic stroke; diffusion weighted imaging

Dear Editor

We thank Reale et al for their interest in our study,[1] and for describing their interesting case and suggestion that the absence of a DWI lesion in a third of our stroke patients was due to a shorter duration of ischemia.

Disappearing DWI lesions are well documented to be associated with short duration and lesser severity of ischaemic insult in animal models.[2] Similarly, in patients, milder strokes are less likely to produce a DWI lesion than severe strokes.[3] Other factors influence DWI lesion visibility. The DWI lesion lasts longer in white than in grey matter, and the DWI lesion disappears more quickly in mild than in severe stroke,[4] presumably reflecting the degree of tissue damage.

In our cohort of patients with a non-disabling stroke referred to by Reale et al, it was not possible to estimate the duration of ischemia precisely. None of our patients underwent angiography or clot retrieval and few were thrombolysed due to the mildness of the stroke or delayed presentation. However, we did record whether the stroke symptoms had resolved by the time of MRI scan: 148/188 patients with a lesion on the diffusion imaging (DWI) sequence at presentation and 46/77 patients without a lesion on the DWI sequence still had ongoing neurological symptoms when the MRI scan was performed (p=0.06). Strokes were slightly more severe in patients with a DWI lesion (NIHSS median 2, IQR 1.2-4) than without a DWI lesion (median NIHSS 2, IQR 1-2, p=0.03) but there was no difference in time to scanning or prevalence of vascular risk factors between the patients with and without a DWI lesion. Therefore we think it is unlikely that the patients without a DWI lesion simply had a shorter duration of ischemia.

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We did note that the patients with a DWI lesion were more likely to have a higher burden of white matter hyperintensities despite being the same age, which might suggest that patients with a DWI lesion were more vulnerable to showing ischaemic change than those without a DWI lesion as suggested in our paper. Other studies have shown that patients with pre-existing brain vascular disease are more likely to have larger infarcts, more infarct growth and worse outcomes[5] than those without prior lesions. Clearly further research is required to evaluate the role of brain vulnerability in determining the response to ischemic stroke.

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