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Poster Viewing Session IV

Image-guided advances for radiologically silent transient ischaemic attacks: Ultra-sensitive molecular MRI discloses endothelial dysfunctions and improved MRI reveals perturbation of the glymphatic system

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Abstract

About 20 % of patients with ischaemic stroke have a preceding transient ischaemic attack (TIA), which is a focal neurological symptoms of ischaemic origin resolving spontaneously. Failure to diagnose TIA is a wasted opportunity to prevent recurrent stroke. Unfortunately, diagnosis can be difficult, due to numerous mimics, and to the absence of specific test. New diagnostic tools are thus needed, in particular for radiologically silent cases (correspond to the recommended tissue-based definition of TIA).

Considering endothelial activation as a hallmark of cerebrovascular events, we postulated that it would be relevant to develop noninvasive in vivo imaging to detect this endothelial activation. Using transcriptional and immunohistological analyses for adhesion molecules in a mouse model, we identified brain endothelial P-selectin as a potential biomarker for TIA. We thus developed ultra-sensitive MRI using antibody-based microparticles of iron oxide targeting P-selectin. This highly sensitive imaging strategy unmasked activated endothelial cells after experimental transient ischaemic attack and allowed discriminating TIA from epilepsy and migraine, two important mimics.We provide preclinical evidence that combining conventional MRI with molecular MRI targeting P-selectin might aid for the diagnosis of TIA[1].

In addition, specific MRI sequences also evidenced that TIA leads to déficits in the glymphatic system, which brings additional insights into our knowledge of post-TIA consequences.

References:

1- Quenault et al., Brain; DOI: 10.1093/brain/aww260