

Dynamic resting state functional connectivity differences between ictal and the pre or postictal phase of migraine

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Background and Aims: Migraine is a phasic disease, with ictal, preictal and postictal phases. Aberrant static resting-state functional connectivity (rs-FC) has been demonstrated in migraine sufferers. However, there are few studies on dynamic rs-FC during migraine. This study aimed to investigate the differences of static and dynamic rs-FC between ictal and pre- or postictal phases of migraine.

Methods: Migraineurs in the ictal (n=16), preictal (11) and postictal (10) phases underwent 3T MRI. We compared the static and dynamic rs-FC among subjects in the ictal preictal and postictal phases using region-of-interest to region-of-interest analyses of 91 cortical, 17 subcortical and 30 infratentorial areas.

Results: Analysis of static rs-FC showed no significant differences among migraineurs in the ictal, preictal and postictal phases. Analysis of dynamic rs-FC demonstrated that migraineurs in the ictal phase had significantly less connectivity between right thalamus and right insular cortex, between left PAG and right interior frontal gyrus, and six other region-of-interest pairs than migraineurs in the preictal phase (Figure 1), as well as significantly less connectivity between the left thalamus and left cerebellum and six other region-of-interest pairs than migraineurs in the postictal phase.

Conclusions: In our study, dynamic rs-FC analysis revealed significantly different connectivity pairs between migraineurs in the ictal and pre- or postictal phases. Our study also revealed that the migraine brain dynamically changed rs-FC during the preictal, ictal and postictal phases.



Figure 1

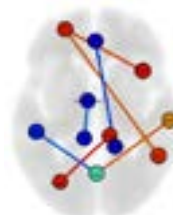


Figure 2

Recent Publications:

- Dumkrieger G, Chong C D, Ross K, et al. (2019) Static and dynamic functional connectivity differences between migraine and persistent post-traumatic headache: A resting-state magnetic resonance imaging study. *Cephalalgia* 39(11):1366-1381.

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- Lee M J, Park B Y, Cho S, et al. (2019) Dynamic functional connectivity of migraine brain: a resting-state fMRI study. *Pain* 160(12):2776-2786.
- Tu Y, Fu Z, Zeng F, et al. (2019) Abnormal thalamocortical network dynamics in migraine. *Neurology* 92(23):e2706-e2716.
- Coppola G, Di Renzo A, Petolicchio B, et al. (2019) Aberrant interactions of cortical networks in chronic migraine: A resting-state fMRI study. *Neurology* 92(22):e2550-e2558.
- May A and Burstein R (2019) Hypothalamic regulation of headache and migraine. *Cephalalgia*. 39(13):1710-1719.

Biography

Noboru Imai is a Neurologist, specialises in diagnosing and treating Headache Disorders including Migraines, Cluster Headaches and other forms of Chronic Headache. He is one of the leading Japanese Headache experts and Clinical Researchers. Noboru Imai is the President of the 49th Annual Japanese Headache Society Meeting. Imai's research focuses on the mechanisms and management of migraine, trigeminal autonomic cephalalgia and medication overuse headaches. His studies aim to investigate the clinical features and neuroimaging findings of headache disorders.

Notes: