Resting-state functional magnetic resonance imaging case series

van Lieshout et al. conducted a retrospective study of nine low-grade glioma patients. Language sites were identified by intraoperative direct electrocortical stimulation (DES). They compared resting-state connectivity (RSC) values between and within groups of DES-positive and DES-negative region of interest (ROIs). Both close-negative sites (i.e., DES-negative sites <1 cm apart from and on the same gyrus as DES-positive sites) and far-negative sites (i.e., purely randomly chosen sites not in the vicinity of the tumor or of the DES-positive sites but on the same lobe) were included. Receiver operating characteristics were used to quantify comparisons.

Functional connectivity between all positive language sites was on average significantly higher than between all close-negative sites and between all far-negative sites. The functional connectivity between the positive language ROIs and their respective close-negative control sites was not smaller than between all positive language sites.

Resting-state functional magnetic resonance imaging likely reflects similar neural information as detected with intraoperative direct electrocortical stimulation (DES), but in its current form does not reach the spatial resolution of DES. ¹⁾.

Resting-state functional magnetic resonance imaging was performed on 11 patients with infantile spasm syndrome, along with 35 age- and sex-matched healthy subjects. Group comparisons between the two groups demonstrate that the pattern of regional synchronization in IS patients is changed. Decreased ReHo values were found in default mode network, bilateral motor-related areas and left occipital gyrus of the patient group. Increased ReHo was found in regions of cingulum, cerebellum, supplementary motor area and brain deep nucleus, such as hippocampus, caudate, thalamus and insula. The significant differences might indicate that epileptic action have some injurious effects on the motor, executive and cognitive related regions. In addition, ReHo values of left precuneus and right superior frontal gyrus were associated with the epilepsy duration in the IS group. The correlation results indicate that the involvement of these regions may be related to the seizure generation. Our results suggest that IS may have an injurious effect on the brain activation. The findings may shed new light on the understanding the neural mechanism of IS epilepsy ²⁾.

1)

van Lieshout J, Debaene W, Rapp M, Noordmans HJ, Rutten GJ. fMRI Resting-State Connectivity between Language and Nonlanguage Areas as Defined by Intraoperative Electrocortical Stimulation in Low-Grade Glioma Patients. J Neurol Surg A Cent Eur Neurosurg. 2021 Feb 22. doi: 10.1055/s-0040-1721757. Epub ahead of print. PMID: 33618418.

Tan Z, Li Y, Zang D, Zhang H, Zhao C, Jiang H, Chen Y, Cao D, Chen L, Liao J, Chen Q, Luan G. Altered regional homogeneity in epileptic patients with infantile spasm: A resting-state fMRI study. J Xray Sci Technol. 2016 Sep 14;24(2):285-95. doi: 10.3233/XST-160559. PubMed PMID: 27002912.

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