



Letter to the Editor

The right insular cortex: A critical region for modulating the sympathetic activity?


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We read the interesting clinical report by Lacuey et al. [1], who investigated that autonomic functional changes between presurgery and postsurgery comparing laterality of radiological insular cortex (Ic) involvement, and who found that the right-sided Ic surgery was associated with increased low frequency (LF)/high frequency (HF) ratio.

Several studies have shown that the cardiovascular system is regulated by a central cortical autonomic network consisting of the Ic, anterior cingulate gyrus, and amygdala [2,3]. Because the Ic is located in the region of the middle cerebral arteries, its structure tends to be exposed to a higher risk of stroke [2]. In an earlier study [4], in patients with drug-refractory epilepsy, the left inactivation induced an increased LF of heart rate and blood pressure (BP). In addition, Oppenheimer et al. [5] identified a site of cardiac representation within the Ic. Tachycardia or pressor effect was significantly more common after stimulation of the right Ic. The degrees of tachycardia and pressor were significantly greater on stimulation of the right anterior Ic than the right posterior Ic [5]. Thus, the anterior portion of right Ic might have strong association with sympathetic nervous system activity.

Moreover, we recently experienced a case where diagnosed herpes encephalitis with right Ic lesion had diffuse left ventricular (LV) hypokinesia at one week after admission [5]. Cardiac 123I-meta-iodobenzylguanidine uptake scintigraphy revealed regional reduced uptake. Thus, LV hypokinesia was suggested to be derived from reduced sympathetic nervous system activity because of right Ic lesion [6]. We also have reported that the right anterior Ic damage in the acute cerebral infarction was associated with decreased BP variability based on the measurements of every 3 h during 3 days from admission [7]. Ischemia of the right anterior Ic might be related to decreased activity of the sympathetic nervous system, leading to relatively increased activity of the parasympathetic nervous system with decreased BP variability.

These results support the notion that the right Ic is predominantly associated with sympathetic autonomic tone. Lacuey et al. [1] reported that the right-sided Ic surgery was associated with increased LF/HF ratio, suggesting that sympathetic autonomic tone was associated with right Ic surgery. In the study reported by Lacuey et al. [1], there were no clear descriptions about the impact of distinct patterns of the respective location according to the anterior or posterior portion of the right Ic on change in LF/HF ratio.

Until now, there have been few reports assessing the relationship between Ic resection and autonomic imbalance according to the anterior/posterior portion in patients with epilepsy. The data presented in the manuscript by Lacuey et al. [1] would be of much more importance if the exact mechanism underlying that relationship was provided.

Declaration of Competing Interest

The authors declare no conflict of interest.

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Michiaki Nagai

Department of Cardiology, Hiroshima City Asa Hospital, Hiroshima, Japan

E-mail address: nagai10m@r6.dion.ne.jp

Keigo Dote

Department of Cardiology, Hiroshima City Asa Hospital, Hiroshima, Japan

Masaya Kato

Department of Cardiology, Hiroshima City Asa Hospital, Hiroshima, Japan

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