

Antipsychotic drug research and resting-state brain activity in normal adults

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In the field of functional MRI, compared to observations of task-related brain activity, a growing number of studies have shown that spontaneous brain activity during the resting state may be more sensitive to defects in the cognitive functions of our brain.

In this issue, Zhu *et al.*^[1] report that methylphenidate (MPH), one of the most commonly-used stimulants for the treatment of attention deficit hyperactivity disorder (ADHD), induces stronger regional homogeneity (ReHo) in the left middle and superior temporal gyrus and weaker ReHo in the left lingual gyrus in normal male adults.

This study reveals several insights. First of all, knowledge of the effects of drugs on the default network contributes to our understanding of the mechanism underlying the action of this network, because the pharmacological effects of many drugs are relatively clear. Such studies prompt questions like: What do cognitive tasks and resting state have in common? ReHo changes in many psychiatric diseases, and abnormal ReHo has been observed in the resting state in ADHD, schizophrenia, Alzheimer's disease, Parkinson's disease, and major depressive disorder^[2-5]. This further encourages the consideration of the functions of the default network that might be important for understanding mental diseases^[2].

Clinically, it is very difficult for patients with mental disorders, especially schizophrenia, to perform tasks during an fMRI scan. Another problem is that different participants may use different strategies to complete a task, and if so, it is conceivable that the results differ greatly even if partici-

pants in the same group perform the same task. So, interpreting the results becomes difficult. However, it is much easier to scan patients in the resting state.

More importantly, this study was carried out in normal adults, not patients, and the results show that "the ReHo in some brain areas changes with MPH compared to placebo in normal adults, even though there are no behavioral differences. This method can be applied to patients with mental illness who may be treated with MPH, and be used to compare the difference between patients taking MPH and normal participants, to help reveal the mechanism of how MPH works."

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