Inter-hemispherical asymmetry in default-mode functional connectivity and BAIAP2 gene are associated with anger expression in ADHD adults.


Attention deficit hyperactivity disorder (ADHD) is accompanied by resting-state alterations, including abnormal activity, connectivity and asymmetry of the default-mode network (DMN). Concurrently, recent studies suggested a link between ADHD and the presence of polymorphisms within the gene BAIAP2 (i.e., brain-specific angiogenesis inhibitor 1-associated protein 2), known to be differentially expressed in brain hemispheres. The clinical and neuroimaging correlates of this polymorphism are still unknown. We investigated the association between BAIAP2 polymorphisms and DMN functional connectivity (FC) asymmetry as well as behavioral measures in ADHD adults. Resting-state fMRI was acquired from 30 ADHD and 15 healthy adults. For each subject, rs7210438 and rs8079626 within the gene BAIAP2 were genotyped. ADHD severity, impulsiveness and anger were assessed for the ADHD group. Using multivariate analysis of variance, we found that genetic features do have an impact on DMN FC asymmetry. In particular, polymorphism rs8079626 affects medial frontal gyrus and inferior parietal lobule connectivity asymmetry, lower for AA than AG/GG carriers. Further, when combining FC asymmetry and the presence of the rs8079626 variant, we successfully predicted increased externalization of anger in ADHD. In conclusion, a complex interplay between genetic vulnerability and inter-hemispherical DMN FC asymmetry plays a role in emotion regulation in adult ADHD.