The impact of SNAP25 on brain functional connectivity density and working memory in ADHD


doi: 10.1016/j.biopsycho.2018.08.005.

Abstract

Attention deficit/hyperactivity disorder (ADHD) is a highly heritable neurodevelopment disorder. The deficit in working memory is a central cognitive impairment in ADHD. The SNAP-25 is a neurotransmitter vesicular docking protein whose MnII polymorphism (rs3746544) is located in the 3'-untranslated region (3'-UTR) and known to be linked to ADHD, but the underlying mechanism of this polymorphism remains unclear. Using a functional connectivity density (FCD) mapping method based on resting-state functional magnetic resonance imaging in a sample of male children diagnosed with ADHD, we first investigated the correlation between SNAP-25 rs3746544 and FCD hubs. Compared with rs3746544 G-allele carriers, TT homozygous, which confers a high risk for ADHD, exhibited significantly decreased local and long-range FCD in anterior cingulate cortex, and decreased local FCD in the dorsal lateral prefrontal cortex. Moreover, both higher local and long-range FCD could predict better WM capacity. The current findings provide new insights into the underlying neural mechanisms linking SNAP-25 rs3746544 with the risk for ADHD via the endophenotype of brain functional connectivity.