

# A haplotype of the dopamine transporter gene modulates regional homogeneity, gray matter volume, and visual memory in children with attention-deficit/hyperactivity disorder.

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Psychol Med. 2018 Feb 13:1-11.  
doi: 10.1017/S0033291718000144.

Abstract

## BACKGROUND:

The dopamine transporter gene (DAT1) and visual memory deficits have been consistently reported to be associated with attention-deficit/hyperactivity disorder (ADHD). This study aimed to examine whether a DAT1 haplotype affected functional and structural brain alterations in children with ADHD and whether those alterations were associated with visual memory.

## METHOD:

We recruited a total of 37 drug-naïve children with ADHD (17 with the DAT1 rs27048 (C)/rs429699 (T) haplotype and 20 without the CT haplotype) and 37 typically developing children (17 with the CT haplotype and 20 without the CT haplotype). Visual memory was assessed by the pattern recognition memory (PRM) and spatial recognition memory (SRM) tasks. We analyzed functional and structural brain architecture with regional homogeneity (ReHo) and gray matter volume (GMV).

## RESULTS:

The CT haplotype was associated with decreased ReHo in the left superior occipital gyrus, cuneus, and precuneus; and decreased GMV in the left superior occipital gyrus, cuneus, and precuneus, and in the right angular gyrus. Significant interactions of ADHD and the CT haplotype were found in the right postcentral gyrus for ReHo and in the right supplementary motor area for GMV. For the ADHD-CT group, we found negative correlations of total correct responses in PRM and SRM and positive correlations of mean latency of correct responses in PRM with the GMV in the left superior occipital gyrus, cuneus, and precuneus.

## CONCLUSIONS:

Our findings suggest that the DAT1-related GMV alterations in the posterior cortical regions may contribute to visual memory performance in children with ADHD.