

Relationship Between White Matter Abnormalities and Neuropsychological Measures in Children With ADHD

Albajara Sáenz A, Villemonteix T, Slama H, Baijot S, Mary A, Balériaux D, Metens T, Kavec M, Peigneux P, Massat I.

J Atten Disord. 2018 Jul 1:1087054718787878.

doi: 10.1177/1087054718787878

Abstract

OBJECTIVE:

Using Diffusion Tensor Imaging (DTI), to investigate microstructural white matter differences between ADHD and typically developing children (TDC), and their association with inhibition and working memory performance usually impaired in ADHD.

METHOD:

Fractional anisotropy (FA) and mean diffusivity (MD) were estimated in 36 noncomorbid children with a Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; DSM-IV-TR) diagnosis of combined type ADHD and 20 TDC. Correlations between FA/MD and Stop Signal Task and N-Back performance parameters were computed.

RESULTS:

Working memory performance was significantly associated with MD in the superior longitudinal fasciculus (SLF) and the cingulum in the ADHD group. No between-group differences in FA/MD reached significance, after controlling for between-group head motion differences.

CONCLUSION:

The association between white matter integrity in the cingulum and the SLF and working memory performance confirms previous studies. Our results also show that when critical conditions are controlled (age, comorbidity, head motion), no ADHD-related structural abnormality (FA/MD) are observed, in line with prior suggestions.