Revealing the Structural Neural Circuitry of Attention Deficit Hyperactivity Disorder with Diffusion MRI: Implications for Future Diagnosis and Treatment.

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Abstract

OBJECTIVE:
Rates of attention deficit hyperactivity disorder (ADHD) diagnosis and psychostimulant prescriptions continue to rise, yet there are no clear diagnostic tests or biomarkers for the disorder. The purpose of this article is to highlight the role of diffusion MRI in bolstering a neurobiologic conceptualization of ADHD and how this holds promise for optimizing future diagnosis.

CONCLUSION:
Diffusion MRI is a powerful neuroimaging tool for noninvasive assessment of the structural neural circuitry underlying brain function and behavior. Though the modality is still in its infancy, diffusion MRI studies are showing neural network disruption in ADHD consistent with findings from other imaging modalities. Given the mounting evidence of brain-behavior correlates in ADHD, it is likely that imaging-based biomarkers will one day be incorporated into clinical diagnosis and treatment evaluation. Until then, diffusion MRI findings serve to validate ADHD as a brain-based disorder with immediate public health implications for individuals with ADHD.