Ventromedial Prefrontal Volume in Adolescence Predicts Hyperactive/Inattentive Symptoms in Adulthood


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Abstract

Youths with attention-deficit/hyperactivity disorder symptomatology often exhibit residual inattention and/or hyperactivity in adulthood; however, this is not true for all individuals. We recently reported that dimensional, multi-informant ratings of hyperactive/inattentive symptoms are associated with ventromedial prefrontal cortex (vmPFC) structure. Herein, we investigate the degree to which vmPFC structure during adolescence predicts hyperactive/inattentive symptomatology at 5-year follow-up. Structural equation modeling was used to test the extent to which adolescent vmPFC volume predicts hyperactive/inattentive symptomatology 5 years later in early adulthood. 1104 participants (M = 14.52 years, standard deviation = 0.42; 583 females) possessed hyperactive/inattentive symptom data at 5-year follow-up, as well as quality controlled neuroimaging data and complete psychometric data at baseline. Self-reports of hyperactive/inattentive symptomatology were obtained during adolescence and at 5-year follow-up using the Strengths and Difficulties Questionnaire (SDQ). At baseline and 5-year follow-up, a hyperactive/inattentive latent variable was derived from items on the SDQ. Baseline vmPFC volume predicted adult hyperactive/inattentive symptomatology (standardized coefficient = -0.274, P < 0.001) while controlling for baseline hyperactive/inattentive symptomatology. These results are the first to reveal relations between adolescent brain structure and adult hyperactive/inattentive symptomatology, and suggest that early structural development of the vmPFC may be consequential for the subsequent expression of hyperactive/inattentive symptoms.