Attention-deficit/hyperactivity disorder symptoms and stress-related biomarkers


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Abstract

Objective
The current study examined whether (a) Attention-Deficit/Hyperactivity Disorder (ADHD) symptoms were associated with dysregulation of stress-related mechanisms, and (b) whether ADHD symptoms interact with affective disorders in their association with dysregulated stress-related mechanisms.

Methods
Data were obtained from 2,307 subjects participating in the Netherlands Study of Depression and Anxiety. Stress-related mechanisms were reflected by the following biomarkers: (1) hypothalamic-pituitary-adrenal axis indicators (salivary cortisol awakening curve, evening cortisol, cortisol suppression after a 0.5 mg dexamethasone suppression test (DST)); (2) autonomic nervous system measures (heart rate, pre-ejection period, respiratory sinus arrhythmia); (3) inflammatory markers (C-reactive protein, interleukin-6, tumor necrosis factor-alpha); (4) brain-derived neurotrophic factor. ADHD symptoms were measured using Conners’ Adult ADHD Rating Scale and used both dichotomous (High ADHD symptoms (yes/no)) and continuous (Inattentive symptoms, Hyperactive/Impulsive symptoms, and the ADHD index).

Results
Regression analyses showed associations between High ADHD symptoms, Inattentive symptoms, the ADHD index and a higher cortisol awakening curve, between Hyperactive/Impulsive symptoms and less cortisol suppression after DST, and between Inattentive symptoms and a longer pre-ejection period. However, the associations with the cortisol awakening curve disappeared after adjustment for depressive and anxiety disorders. No associations were observed between ADHD symptoms and inflammatory markers or BDNF. ADHD symptoms did not interact with affective disorders in dysregulation of stress-related mechanisms.

Conclusion
Some associations were observed between ADHD symptoms, the HPA-axis, and the pre-ejection period, but these were mostly driven by depressive and anxiety disorders. This study found no evidence that ADHD symptomatology was associated with dysregulations in inflammatory markers and BDNF. Consequently, ADHD symptoms did not confer an added risk to the disturbances of stress-related mechanisms in an − already at-risk − population with affective disorders.