Associations Between Autoimmune Diseases and Attention-Deficit/Hyperactivity Disorder: A Nationwide Study

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Abstract

Objective
Recent studies suggest that autoimmune diseases and immune activation play a part in the pathogenesis in a range of neurodevelopmental disorders. In this study, we investigate the association between a personal and a family history of autoimmune disease and the risk of developing attention-deficit/hyperactivity disorder (ADHD).

Method
We formed a cohort of all singletons born in Denmark 1990-2007 resulting in a study population of 983,680 individuals followed from 1995 to 2012. Information on autoimmune diseases was obtained from the Danish National Hospital Register. Individuals with ADHD were identified through the Danish National Hospital Register and the Danish Psychiatric Central Register.

Results
A total of 23,645 children were diagnosed with ADHD during the study period. Autoimmune disease in the individual was associated with an increased risk of ADHD by an incidence rate ratio (IRR) of 1.24 (95% CI: 1.10-1.40). In our primary analyses, we found maternal autoimmune disease to be associated with ADHD in the offspring with an IRR of 1.12 (95% CI:1.06-1.19), whereas a paternal history of autoimmune diseases was not significantly associated with ADHD in the offspring. In exploratory analyses, an increased risk of ADHD was observed for children with a family history of thyrotoxicosis, type 1 diabetes, autoimmune hepatitis, psoriasis, and ankylosing spondylitis.

Conclusion
We found that a personal and maternal history of autoimmune disease was associated with an increased risk of ADHD. We confirmed the association between type 1 diabetes and ADHD, found previously. Finally, we found specific parental autoimmune diseases to be associated with ADHD in offspring.