

Functional brain correlates of motor response inhibition in children with developmental coordination disorder and attention deficit/hyperactivity disorder

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Human Movement Science Volume 59, June 2018, Pages 134-142

DOI: <https://doi.org/10.1016/j.humov.2018.03.018>

Abstract

Motor impairment is associated with developmental coordination disorder (DCD), and to a lesser extent with attention-deficit/hyperactivity disorder (ADHD). Previous functional imaging studies investigated children with DCD or ADHD only; however, these two disorders co-occur in up to 50% of cases, suggesting that similar neural correlates are associated with these disorders. This study compared functional brain activation in children and adolescents (age range 8–17, $M = 11.73$, $SD = 2.88$) with DCD ($n = 9$), ADHD ($n = 20$), co-occurring DCD and ADHD ($n = 18$) and typically developing (TD) controls ($n = 20$). When compared to TD controls, children with co-occurring DCD/ADHD showed decreased activation during response inhibition in primary motor and sensory cortices. These findings suggest that children with co-occurring DCD and ADHD display significant functional changes in brain activation that could interfere with inhibition of erroneous motor responses. In contrast to previous studies, significant alterations in brain activation relative to TD controls, were not found in children with isolated DCD or ADHD. These findings highlight the importance of considering co-occurring disorders when investigating brain function in children with neurodevelopmental disorders.