

Preliminary evidence of altered neural response during intertemporal choice of losses in adult attention-deficit hyperactivity disorder.

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Abstract

Impulsive behaviours are common symptoms of attention-deficit hyperactivity disorder (ADHD). Although previous studies have suggested functional models of impulsive behaviour, a full explanation of impulsivity in ADHD remains elusive. To investigate the detailed mechanisms behind impulsive behaviour in ADHD, we applied an economic intertemporal choice task involving gains and losses to adults with ADHD and healthy controls and measured brain activity by functional magnetic resonance imaging. In the intertemporal choice of future gains, we observed no behavioural or neural difference between the two groups. In the intertemporal choice of future losses, adults with ADHD exhibited higher discount rates than the control participants. Furthermore, a comparison of brain activity representing the sensitivity of future loss in the two groups revealed significantly lower activity in the striatum and higher activity in the amygdala in adults with ADHD than in controls. Our preliminary findings suggest that an altered size sensitivity to future loss is involved in apparent impulsive choice behaviour in adults with ADHD and shed light on the multifaceted impulsivity underlying ADHD.