Long-Term Outcomes of Attention-Deficit/Hyperactivity Disorder and Conduct Disorder: A Systematic Review and Meta-Analysis

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Abstract

Objective
Attention-deficit/hyperactivity disorder (ADHD) and conduct disorder (CD) are common externalising disorders. Despite previous research demonstrating that both are longitudinally associated with adverse outcomes, there have been no systematic reviews examining all the available evidence linking ADHD and CD with a range of health and psychosocial outcomes.

Method
Electronic databases (EMBASE, Medline, and PsycINFO) were searched for studies published from 1980 up to March 2015. Published cohort and case-control studies were included if they reported a longitudinal association between ADHD or CD and adverse outcomes with a minimum follow-up of two years. Outcomes with sufficient data were pooled in a random effects meta-analysis to give overall odds ratios (ORs) with corresponding 95% CIs.

Results
Of the 278 studies assessed, 114 met inclusion criteria and 98 were used in subsequent meta-analyses. ADHD was associated with adverse outcomes including academic achievement (e.g. failure to complete high school [OR: 3.7, 2.0-7.0]), other mental and substance use disorders (e.g. depression [OR: 2.3, 1.5-3.7]), criminality (e.g. arrest [OR: 2.4, 1.5-3.8]), and employment (e.g. unemployment [OR: 2.0, 1.0-3.9]). CD was associated with outcomes relating to academic achievement (e.g. failure to complete high school [OR: 2.7, 1.5-4.7]), other mental and substance use disorders (e.g. illicit drug use [OR: 2.1, 1.7-2.6]), and criminality (e.g. violence [OR: 3.5, 2.3-5.3]).

Conclusion
This study demonstrated that ADHD and CD are associated with disability beyond immediate health loss. Although the analyses could not determine the mechanisms behind these longitudinal associations, they demonstrate the importance of addressing ADHD and CD early in life so as to potentially avert a wide range of future adverse outcomes.