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The role of genetics in neurodevelopmental disorders and their comorbidity with disruptive, impulse control and conduct disorders during childhood and adolescence. A meta-analysis.

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ABSTRACT:

A systematic understanding of the aetiology of neurodevelopmental disorders (NDDs) and of their comorbidities during childhood and adolescence remains incomplete. A disproportionate number of studies have focused on autism spectrum disorder (ASD) and attention deficit/hyperactivity disorder (ADHD), but other neurodevelopmental conditions have been overlooked. With three core aims, this meta-analysis bridges current gaps in our knowledge. First, we obtained meta-analytic estimates for the relative contribution of genetic and environmental influences to all NDDs categories defined in the DSM-5. Second, we meta-analysed estimates of the genetic and environmental overlap between NDDs. Third, we examined the comorbidity between NDDs and disruptive, impulse control and conduct disorders (DICC). A total of 8,040 studies were screened by two independent reviewers, which yielded 293 eligible studies. We performed preliminary random-effects, multilevel meta-analyses, considering family-based and SNP-based estimates separately. Family-based designs yielded a grand heritability estimate for NDDs of 0.66 (SE = 0.03), ranging from 0.62 (0.04) for Specific Learning Disorder to 0.76 (0.11) for ASD; SNP-based studies yielded an estimate of 0.19 (0.03). The genetic correlation among NDDs was 0.41 (0.14) for family-based studies and 0.39 (0.19) for SNP-based ones. The genetic correlation between NDDs and DICC was 0.60 (0.18) for family-based designs. This meta-analysis extends our knowledge of NDDs in several directions. First, it provides a holistic view of genetic and environmental contributions to all NDDs and to their comorbidities over development. Second, it identifies clear gaps in the literature which point the way to future research. Third, it equips clinicians and educators with crucial new knowledge.

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