Heritability and genetic comorbidity of attention deficit disorder with hyperactivity

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Abstract

This review aims to summarize information about the genetic etiology of attention deficit disorder with hyperactivity (ADHD), with particular reference to the contributions of our research group. We also discuss the genetic comorbidity estimated from genome-wide single nucleotide polymorphisms (SNP’s) between ADHD and major psychiatric disorders such as schizophrenia (E), major depressive disorder (MDD), bipolar disorder (BD) and autism spectrum disorders (ASD). A high genetic comorbidity was found between E and BD (46%), a moderate comorbidity between MDD and E, MDD and BD and MDD and ADHD (18%, 22%, and 10% respectively) and a low comorbidity between E and ASD (2.5%). Furthermore, we show evidence concerning the genetic determination of psychiatric diseases, which is significantly lower when it is estimated from genome-wide SNP’s rather than using traditional quantitative genetic methodology (ADHD = E = 23%, BD = 25%, MDD = 21% and ASD = 17%). From an evolutionary perspective, we suggest that behavioral traits such as hyperactivity, inattention, and impulsivity, which play a role in ADHD and perhaps also other hereditary traits which are part of major psychiatric disorders, could have had a high adaptive value during the early stages of the evolution of Homo sapiens. However, they became progressively less adaptive and definitively disadvantageous, to the extreme that they are involved in frequently diagnosed major psychiatric disorders.