The predictive capacity of psychiatric and psychological polygenic risk scores for distinguishing cases in a child and adolescent psychiatric sample from controls

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ABSTRACT:

Psychiatric traits are heritable, comorbid and genetically correlated making it plausible that there are shared genetic effects between these disorders. This study quantifies the predictive capacity of 14 polygenic risk scores (PRS) of traits related to psychiatric disorders by means of a case-control study in a child and adolescent sample (N=1,402) with mixed and multiple diagnoses and healthy controls (N=1,448). A PRS is a single measure of the common genetic risk an individual has for a certain trait. Included PRS are educational attainment, intelligence, smoking initiation, Neuroticism, insomnia, risk taking behavior, anti-social behavior, ADHD, ASD, schizophrenia, major depressive disorder, anxiety, alcohol dependence and bipolar disorder. These PRS were first individually tested in univariate regression model. A secondary analysis entails the testing of significantly associated PRS together in a multivariate model. The univariate analysis showed significant association with case control status for educational attainment, intelligence, smoking initiation, Neuroticism, insomnia, risk taking behavior, anti-social behavior, ADHD, major depressive disorder and alcohol dependence. The two main findings are educational attainment (p-value: 3.53E-20, explained variance: 3.99%, OR: 0.66) and smoking initiation (p-value: 4.77E-10, explained variance: 1.91%, OR: 1.33). The secondary analysis showed significant association of educational attainment and smoking initiation. The explained variance of the PRS in the multivariate model with these eight traits combined was 5.9%. This study provides more insights into the genetic signal that is shared between childhood and adolescent psychiatric disorders and might guide future studies on psychiatric comorbidity and offer insights into shared etiology between psychiatric disorders.

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