Understanding the covariation of tics, attention-deficit/hyperactivity, and obsessive-compulsive symptoms: A population-based adult twin study.

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Abstract
Chronic tic disorders (TD), attention-deficit/hyperactivity-disorder (ADHD), and obsessive-compulsive disorder (OCD) frequently co-occur in clinical and epidemiological samples. Family studies have found evidence of shared familial transmission between TD and OCD, whereas the familial association between these disorders and ADHD is less clear. This study aimed to investigate to what extent liability of tics, attention-deficit/hyperactivity, and obsessive-compulsive symptoms is caused by shared or distinct genetic or environmental influences, in a large population-representative sample of Swedish adult twins (n = 21,911). Tics, attention-deficit/hyperactivity, and obsessive-compulsive symptoms showed modest, but significant covariation. Model fitting suggested a latent liability factor underlying the three phenotypes. This common factor was relatively heritable, and explained significantly less of the variance of attention-deficit/hyperactivity symptom liability. The majority of genetic variance was specific rather than shared. The greatest proportion of total variance in liability of tics, attention-deficit/hyperactivity, and obsessive-compulsive symptoms was attributed to specific non-shared environmental influences. Our findings suggest that the co-occurrence of tics and obsessive-compulsive symptoms, and to a lesser extent attention-deficit/hyperactivity symptoms, can be partly explained by shared etiological influences. However, these phenotypes do not appear to be alternative expressions of the same underlying genetic liability. Further research examining sub-dimensions of these phenotypes may serve to further clarify the association between these disorders and identify more genetically homogenous symptom subtypes.