Association of PIK3CG gene polymorphisms with attention-deficit/hyperactivity disorder: A case-control study.


Abstract

Attention-deficit/hyperactivity disorder (ADHD) is a complicated neurodevelopmental disorder with high heritability. This study explores the association of PIK3CG gene single nucleotide polymorphisms (rs1129293, rs12536620, rs12667819, rs17847825, rs2230460) with ADHD in children and the relation of interaction between SNPs and environmental factors, including blood lead levels (BLLs) and feeding style. A case-control study was conducted with children aged 6-18 years old, consisting of 389 children newly diagnosed with ADHD via the DSM-IV at the Wuhan Women and Children Medical Care Center, and 393 control participants were healthy children for physical examination during the same period. All participants were tested using the Chinese Wechsler Intelligence Scale for Children and Parent Symptom Questionnaire (PSQ). Furthermore, a self-designed questionnaire was used to investigate the general situation and related environmental factors, and the BLLs were measured by atomic absorption spectrophotometry. The genotyping was performed using Sequenom MassArray. In our study, PIK3CG gene rs12667819 was consistently shown to be associated with ADHD risk in dominant model (OR=1.656, 95% CI=1.229-2.232), ADHD-I type (OR=2.278, 95% CI=1.666-4.632), and symptom scores. Moreover, rs12536620 has been observed to be related to ADHD-C type and symptom scores. Intriguingly, gene-environmental interactions analysis consistently revealed the potential interactions of rs12667819 collaborating with blood lead (Pmult=0.045) and feeding style (Pmult=0.041) to modify ADHD risk. Expression quantitative trait loci analysis suggested that rs12667819 may mediate PIK3CG gene expression. Therefore, our results suggest that selected PIK3CG gene variants may have a significant effect on ADHD risk.