Genetic associations between ADHD and dopaminergic genes (DAT1 and DRD4) VNTRs in Korean children

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Abstract

It is well known that dopaminergic genes affect the development of attention deficit hyperactivity disorder (ADHD) in various populations. Many studies have shown that variable number tandem repeats (VNTRs) located within the 3'-untranslated region of DAT1 and in exon 3 of DRD4 are associated with ADHD development; however, these results were inconsistent. Therefore, we investigated the genetic association between two VNTRs and ADHD in Korean children. We determined the VNTRs using PCR. We examined genotype and allele frequency differences between the experimental and control groups, along with the odds ratios, using Chi square and exact tests. We observed a significant association between the children with ADHD and the control group in the 10R/10R genotype of DAT1 VNTRs (p = 0.025). In addition, the 11R allele of DAT1 VNTRs showed a higher frequency in the control group than in the ADHD group (p = 0.023). Also, the short repeat (without 11R) and long repeat alleles (including 11R) were associated with ADHD (p < 0.05). The analysis of DRD4 VNTRs revealed that the 2R allele is associated with ADHD (p = 0.025). A significant result was also observed in long and short repeats (p < 0.05). Additionally, ADHD subtypes showed that the DRD4 VNTRs are associated with combined and hyperactive-impulsive subtype groups (p < 0.05). Therefore, our results suggest that DAT1 VNTRs and DRD4 VNTRs play a role in the genetic etiology of ADHD in Korean children.