Association between ANKK1 (rs1800497) polymorphism of DRD2 gene and attention deficit hyperactivity disorder: A meta-analysis

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Abstract
The role of dopamine neurotransmitter in attention deficit hyperactivity disorder (ADHD) remains controversial. Many molecular studies focusing on dopamine receptors have attempted to analyze the gene polymorphisms involved in dopaminergic transmission. Of these, rs1800497 (TaqIA) single nucleotide polymorphism (SNP) of the dopamine D2 receptor (DRD2) gene has been focused on by the most attention. However, this locus has recently been identified within the exon 8 of ankyrin repeat and kinase domain containing 1 (ANKK1), giving rise to a Glu713-to-Lys substitution in the putative ANKK1 protein. Thus, we performed a meta-analysis to determine whether ANKK1 polymorphism influences the risk of ADHD and examined the relationship between rs1800497 genetic variant and the etiology of ADHD. Relevant case-control studies were retrieved by database searches and selected according to established inclusion criteria. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated to evaluate the strength of the associations. Meta-regression, subgroup analysis, sensitivity analysis and cumulative meta-analysis were performed. A total of 11 studies with 1645 cases and 1641 controls were included. In the dominant model, the rs1800497 locus was associated with ADHD, with a pooled OR of 1.785 (95% CI = 1.068–2.984, p = 0.027). Subgroup analysis for ethnicity indicated that the polymorphism was associated with ADHD in Africans (OR = 3.286, 95% CI = 1.434–7.527, p = 0.005), but not in East Asians (OR = 1.513, 95% CI = 0.817–2.805, p = 0.188) and Caucasians (OR = 1.740, 95% CI = 0.928–3.263, p = 0.084). However, the results of meta-regression indicated that publication date (p = 0.601), source of controls (p = 0.685), ethnicity (p = 0.755) and diagnostic criteria (p = 0.104) could not explain the potential sources of heterogeneity. This meta-analysis indicates that the rs1800497 locus may be associated with ADHD. These data provide possible references for future case-control studies in childhood disorders.