Evidence for association between a polymorphism in the Adenosine A2A receptor gene and attention deficit hyperactivity disorder

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Attention deficit hyperactivity disorder (ADHD) is a common and highly heritable disorder of childhood characterized by developmentally inappropriate inattentiveness, impulsivity, and hyperactivity. Genetic risk variants in several genes involved in regulation of dopamine and related neurotransmitter pathways are reported to be associated with ADHD. Some studies have suggested that adenosine A2A receptor (ADORA2A) plays an important role in different brain circuits and pathways involved in psychiatric disorders. Several lines of evidence implicate a relationship between mood disorder, anxiety, schizophrenia and ADORA2A gene polymorphisms. A recent study has reported that a polymorphism of ADORA2A gene is associated with attention-deficit hyperactivity disorder traits. In this study we investigated the association between the ADORA2A gene polymorphisms (rs3761422, rs35320474) and ADHD. Two samples of ADHD probands from Taiwan (n = 150) and the United Kingdom (n = 180) were genotyped and analyzed using within-family transmission disequilibrium test (TDT). We found evidence of increased transmission of the C allele of the rs3761422 polymorphism in Taiwanese samples (P=0.0018). No association was detected between the rs35320474 polymorphism and ADHD in either of the two populations. This study provides evidence for the possible involvement of ADORA2A in susceptibility to ADHD in Taiwanese population.

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