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## Associations between related factors and neurotransmitter pathway gene polymorphisms and child attention deficit hyperactivity disorder

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**Objective:** Related social factors and neurotransmitter pathway gene polymorphism of child Attention Deficit-Hyperactivity Disorder (ADHD) was investigated to provide evidence for ADHD prevention and control and clue for further ADHD genetic study.

**Methodology:** In the case-control study, social information of 233 ADHD children and 711 health children were investigated by a self-designed questionnaire. Blood samples of 168 ADHD children and 233 health children were collected. 10 Single Nucleotide Polymorphisms (SNPs) of *SLC6A3*, *DRD4*, *SLC6A2* and *ADRA2A* were tested.

**Findings:** In multiple logistic regression, ADHD were related to male (OR=4.96, 95% CI: 3.28-7.49), 6-9 years old (OR=1.77, 95% CI: 1.24-2.53), family month income  $\leq$ 3000 yuan per capita (OR=1.85, 95% CI: 1.31-2.61), preterm birth (OR=3.09, 95% CI: 1.15-8.33), mother general or poor mood (OR=1.67, 95% CI: 1.18-2.36) and indirect smoking (OR=1.81, 95% CI: 1.20-2.72) during pregnancy, general or poor parents relationship (OR=1.92, 95% CI: 1.31-2.82), father accompany with child <4 hours a week (OR=1.80, 95% CI: 1.16-2.79), house decoration last year (OR=1.62, 95% CI: 1.03-2.55) and child indirect smoking (OR=1.77, 95% CI: 1.16-2.69). Adjusted for child sex and age, *DRD4 rs747302, DRD4 rs3758653* and *ADRA2A rs521674* polymorphisms were associated with ADHD, ADHD subtype and ADHD-ODD (all P<0.05). *SLC6A2 rs168924* and *DRD4 rs1800955* polymorphisms were related to ADHD and ADHD subtype (both P<0.05). There were significant associations between *ADRA2A rs2484516* polymorphisms and ADHD-Inattention (P<0.05), between *SLC6A2 rs40615* polymorphism and ADHD-Hyperactive+Combined and ADHD-ODD (both P<0.05), and between *rs28386840* polymorphism and ADHD-ODD (P<0.05).

**Conclusion:** Boy aged 6-9 years old and preterm children should be screened preferentially for ADHD in order to find ADHD susceptible children as early as possible. Effects of adverse factors during pregnancy, poor parents and parent-child relationship and adverse family environment on ADHD are recommended to health education. The polymorphisms of *DRD4 (rs747302, rs3758653, rs1800955), ADRA2A (rs521674, rs2484516)* and *SLC6A2 (rs168924, rs40615, rs28386840)* may be the potential functional SNPs related to ADHD and further functional researches are needed.

## **Recent Publications**

- 1. Du Y K (2016) Genetic variant in CXCL13 gene is associated with susceptibility to intrauterine infection of hepatitis B virus. *Sci Rep.*; 6: 26465.
- 2. Du Y K (2016) Relationships between plasma leptin levels, leptin G2548A, leptin receptor Gln223Arg polymorphisms and gestational diabetes mellitus in Chinese population. *Sci Rep.*; 6: 23948.

## Biography

Yu-Kai Du has expertise in maternal and child healthcare. He is presently working in Department of Maternal and Child Health, Tongji Medical College, Huazhong University of Science and Technology. He has undertaken many national natural science funds projects on vertical transmission of hepatitis B virus in the Chinese population. He has also worked as the Director of Chinese Society of Rural Health, the Director of Standing of Hubei Society of Family Education and Hubei Society of Comprehensive Development of Children Secretary-General, the Committee of Chinese Maternal and Child Experts' Committee and the expert group of prevention of mother-to-child transmission of HIV, China's Ministry of Health.

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