The Alpha-2A Adrenergic Receptor Gene -1291C/G Single Nucleotide Polymorphism is Associated with the Efficacy of Methylphenidate in Treating Taiwanese Children and Adolescents with Attention-Deficit Hyperactivity Disorder.


Abstract

OBJECTIVE:
The therapeutic effect of methylphenidate (MPH) in treating attention-deficit/hyperactivity disorder (ADHD) has been related to the alpha-2A adrenergic receptor (ADRA2A) gene -1291C/G single nucleotide polymorphism (SNP). We investigated the effect of MPH in treating Taiwanese children and adolescent with ADHD and its relation to the ADRA2A gene -1291C/G SNP.

METHODS:
The subjects with DSM-IV ADHD diagnosis underwent a titration period to find out the dose of MPH for maintenance treatment. After 4 weeks maintenance treatment, the effect of MPH was evaluated by the Swanson, Nolan and Pelham version IV total scores. The subjects with more than 25% score reduction were referred to responders and those with ≥50% improvement were considered as better responders. The -1291C/G variant of the ADRA2A gene was identified by DNA sequencing and what relevance it has to the MPH response was examined by binary logistic regression analysis.

RESULTS:
Of the 59 subjects, 44 (74.6%) were responsive to MPH treatment and the responsiveness was not shown to be associated with the ADRA2A gene -1291C/G SNP. As the responsive subjects were categorized as moderate responders and better responders and subjected to statistical analysis, the GG homozygotes showed a greater chance to have a better response to MPH treatment than CC homozygotes (p=0.02), with an odds ratio of 32.14 (95% CI=1.64-627.80).

CONCLUSION:
The ADRA2A gene -1291C/G SNP is associated with the efficacy of MPH for the treatment of ADHD in Taiwanese children and adolescents. The responsive subjects bearing homozygous -1291G allele are more likely to have a better response to MPH treatment.