Association of glutathione S-transferases M1, T1 and P1 gene polymorphisms with attention deficit and hyperactivity disorder in Korean children.

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Abstract

Attention deficit and hyperactivity disorder (ADHD) is highly heritable disorder and common in school-age children characterized by inattention, hyperactivity and impulsivity. Although its heritability was estimated at 80-90% from family, adoption and twin studies, the molecular etiology of this disorder has not elucidated. Meanwhile, an impaired balance of oxidant-antioxidant status and increased oxidative stress is observed in ADHD, and it may imply a possible relationship between oxidative stress and etiology of ADHD. Glutathione S-transferase (GST) is antioxidant enzymes that play a key role in the cellular detoxification. In the present study, we examined the association between the genetic polymorphisms of GSTM1, GSTP1 and GSTT1, and ADHD in Korean children. Case-control study was conducted with 243 ADHD children and 327 controls. There were no significant associations between the polymorphisms and the incidence of ADHD (p>0.05). However, significant associations were observed in the stratified analyses. The frequency of GSTP1 Ile/Ile genotype is reached to the significant level in the hyperactivity subtype (88.2%) compared to controls (64.8%) (p=0.035) and the frequency of GSTT1-null genotype is significantly higher in the inattentive boys (p=0.005). Meanwhile, GSTT1-null genotype showed significant associations in combined subtype (p=0.016) and hyperactivity subtype (p=0.036) of the ADHD girls. Thus our result imply that the polymorphisms in the GST genes may affect ADHD, however, replication study for larger sample set and functional studies are crucial to confirm these findings.