Increased levels of plasma glial-derived neurotrophic factor in children with attention deficit hyperactivity disorder.

Shim SH, Hwangbo Y, Yoon HJ, Kwon YJ, Lee HY, Hwang JA, Kim YK.


Abstract
Background: Recent evidence suggests that neurotrophic growth factor systems, including brain-derived neurotrophic factor, might be involved in the pathophysiology of attention deficit hyperactivity disorder (ADHD). Glial cell line-derived neurotrophic factor (GDNF) is from the transforming growth factor-β family and is abundantly expressed in the central nervous system, where it plays a role in the development and function of hippocampal cells. To date, no association studies have been done between ADHD and GDNF. Thus, here we investigate the hypothesis that there are differences in plasma GDNF levels between children with ADHD and healthy controls.

Methods: Plasma GDNF levels were measured in 86 drug-naïve children with ADHD and 128 healthy children. The severity of ADHD symptoms was determined by scores on the Korean ADHD Rating Scale (K-ARS) in patients and healthy controls.

Results: The median plasma GDNF levels in ADHD patients was 74.0 (IQR: 23.4-280.1) pg/ml versus 24.6 (IQR: 14.5-87.3) pg/ml in healthy controls; thus the median plasma GDNF levels in ADHD patients were significantly higher than in healthy controls (Mann-Whitney U-test, P < 0.01). Plasma GDNF levels were correlated positively with K-ARS subscale scores (inattention, hyperactivity-impulsivity and total), determined by Spearman’s correlation test in ADHD patients and healthy controls (r = 0.371, P < 0.01; r = 0.331, P < 0.01; and r = 0.379, P < 0.01, respectively).

Conclusions: These findings suggest increased plasma GDNF levels in untreated ADHD patients. In addition, plasma GDNF levels had a significant positive correlation with inattention, hyperactivity-impulsivity and K-ARS total scores in ADHD patients and healthy controls. Further studies are required to determine the source and role of circulating GDNF in ADHD.