

Evaluation of estrogen and G protein-coupled estrogen receptor 1 (GPER) levels in drug-naïve patients with attention deficit hyperactivity disorder (ADHD).

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Abstract

Estrogen has a crucial role in the regulation of reproductive and neuroendocrine function and exerts its effects through two classes of receptors, nuclear and membrane estrogen receptors (mERs). G protein-coupled estrogen receptor 1 (GPER) is a member of mERs, and despite limited research on the levels of GPER in patients with psychiatric diseases, a role of GPER in such conditions has been suggested. Here we evaluated serum estrogen and GPER levels in children with attention deficit hyperactivity disorder (ADHD) in relation to their age- and gender-matched healthy controls. A total of 82 children were included in the study, 47 drug-naïve patients with ADHD (age: 6-12 years; male/female: 34/13) and 35 healthy controls (age: 6-12 years; male/female: 19/16). The subgroups according to ADHD types were inattentive, hyperactive/impulsive, and combined. Serum estrogen was measured using an immunoassay system, while serum GPER was determined using a commercial sandwich enzyme-linked immunosorbent assay kit. Estrogen levels in children with ADHD were similar as in control group, while GPER levels were significantly lower in ADHD group compared to controls ($p < 0.05$). Logistic regression analysis showed a significant association between GPER levels and ADHD ($p < 0.05$), and no association between estrogen levels and ADHD ($p > 0.05$). No significant differences were found in GPER and estrogen levels between ADHD subgroups ($p > 0.05$). To the best of our knowledge, this study is the first to investigate estrogen and GPER levels in ADHD. Our preliminary findings suggest a relationship between serum GPER levels and ADHD, and this should be further investigated.