Thiol/Disulphide Homeostasis and Oxidative Stress Parameters in Children and Adolescents with Attention Deficit/Hyperactivity Disorder

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Abstract

Aim:
Research investigating association between attention deficit/hyperactivity disorder (ADHD) and oxidative stress have reported conflicting and inconsistent findings. We aimed to investigate a novel oxidative stress marker, thiol/disulphide homeostasis, in patients with ADHD and compare the results with the healthy control group.

Materials and Methods:
A total of 47 medication naïve children and adolescents (35 boys and 12 girls) aged 6–17 years with a diagnosis of ADHD were investigated for oxidative stress parameters and results were compared with that of 41 subjects (28 boys and 13 girls) matched for age and gender. The Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (KSADS-PL) was conducted to support ADHD diagnosis and to exclude comorbid psychiatric disorders. Thiols, total antioxidant status (TAS), total oxidant status (TOS), oxidative stress index (OSI) levels were measured in serum samples in addition to myeloperoxidase (MPO) and dynamic thiol/disulphide homeostasis.

Results:
TOS, OSI and MPO levels were significantly lower in ADHD group (p=0.001, p=0.022, p=0.007, respectively). Predominantly inattentive type ADHD had significantly higher levels of TAS (p=0.014) and TOS (p=0.01) than those with combined ADHD subtype. Oxidative stress index (OSI) levels decreased with increasing age in both ADHD and control groups as well in the whole sample when control and patient groups were tested together (r=-0.376, p=0.009; r=-0.479, p= 0.002; and r=-0.367, p<0.001, respectively). TAS scores significantly increased with age in ADHD group (r= 0.523, p<0.001). Thiol/disulphide homeostasis showed no difference.

Discussion and Conclusion:
The current study reveals no association between pediatric-age ADHD and thiol/disulphide homeostasis. The nature of relationship between oxidative stress and ADHD needs to be clarified with methodologically robust studies.