

AGMATINE ATTENUATES ATTENTION DEFICIT HYPERACTIVITY DISORDER USING EXPOSURE OF 6-OHDA IN MICE

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ABSTRACT

Introduction: Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder that affects both children and adults and is characterized by persistent patterns of inattention, hyperactivity, and impulsivity. During adolescence, the prefrontal cortex develops connectivity with other brain regions to engage executive functions and impulsive behavior. Thus injecting 6-hydroxydopamine, a neurotoxin results in lesioning of dopaminergic neurons which results in motor and cognitive impairments, similar to the ADHD in humans. This study was planned to investigate the effect of agmatine a primary amino compound and a member of guanidines on 6-OHDA-induced ADHD-like behavior in mice. **Methods:** Animals administered with 6-OHDA on PND 5, exhibited the major ADHD-like symptoms, i.e. hyperactivity in open field test, attention deficit and impulsivity in object-based attention task. Further, the model revealed discrete co-existing symptoms, i.e. memory deficits, anxiety-related compulsive-like behavior, depressive and anti-social behavior in three chamber Social Interaction task. **Result:** In the present study, 6-OHDA-induced ADHD-like behavior was significantly attenuated by agmatine (20, 40, and 80 mg/kg, i.p.), L-Arginine (60 mg/kg, i.p.), Aminoguanidine (50 mg/kg, i.p.). Additionally, agmatine reduces elevated oxidative stress parameters and increases reduced dopamine level in the 6-OHDA mice brain. **Conclusion:** These findings suggest that agmatine can be a potential therapeutic target for behavioral alteration associated with ADHD.

Keywords: Attention-Deficit/Hyperactivity Disorder (ADHD), Agmatine, 6-hydroxydopamine (6-OHDA), Dopamine, L-Arginine, Aminoguanidine.