



# Is Taurine a Possible Option for Attention-Deficit Hyperactivity Disorder (ADHD)

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## Editorial

Known as a most prevalent neurodevelopmental disorder among children, the patients of Attention-Deficit Hyperactivity Disorder (ADHD) mainly suffer from hyperactivity, impulsiveness and inattention last long, leading to functional impairments [1]. Although the etiology of ADHD is still not well-identified [2], many investigations have proposed a model of multiple causal pathways on the etiology of ADHD, which implies earlier onsets of critical neural and neuropsychological deviations from development of ADHD symptoms [3,4].

Since typical treatments such as utilizing methylphenidate (MPH) for ADHD have been reported to have serious adverse effects [5], various alternative strategies for treating ADHD have been suggested [6,7]. Recently, the interest in the development of natural product-derived treatments and nutritional supplements on ADHD therapy has been growing [8]. Taurine is the most plentiful amino acid in the central nervous system and manifest various biological functions in the body, especially the roles in nerve development and neuro-modulation [9]. Notably, taurine has also been clinically used in many diseases [10]. However, administration of taurine in different dosages reveals distinct effects. A recent study reported that low dose taurine activates glycine receptors, whereas high dose taurine activates both Glycine and Gamma-Aminobutyric Acid A (GABAA) receptors in Preoptic Hypothalamic Area (PHA) neurons [11].

Surprisingly, a recent finding indicated that administration of high-dose taurine has inverse effects on brain functional signals and hyperactive behavior in SHR rats. Although significantly higher horizontal locomotion and mALFF signal in bilateral hippocampus in SHR rats fed with a low-dose taurine, significantly decreased horizontal locomotion and mALFF signal in bilateral hippocampus were observed in those fed with a high-dose taurine [12]. These phenomena may be due to the opposite effects of taurine on striatal Dopamine Transporter (DAT) expression and dopamine uptake [data in submitting].

Presently, the treatment for ADHD is drug-based and has higher risk in toxic and addictive sequelae. Since taurine is non-toxic on humans and has been clinically used in many disorders, the thought of high-dose taurine as a candidate for ADHD treatment could be possible in the future. However, further experimental and clinical studies are required to elucidate the mechanism and possible therapeutic potential of taurine in ADHD.

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