

Long-term ADHD treatment increases brain dopamine transporter levels, may affect drug efficacy

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Long-term treatment of attention deficit/hyperactivity disorder (ADHD) with certain stimulant medications may alter the density of the dopamine transporter, according to research published May 15 in the open access journal *PLOS ONE* by Gene-Jack Wang and colleagues from Brookhaven National Laboratory and the intramural program at NIH.

[ADHD](#) is commonly treated using drugs to target dysfunctional dopamine signaling in the brain, such as [methylphenidate](#) (commonly known as Ritalin). The researchers found that adults with ADHD who had been prescribed the drug methylphenidate for a period of 12 months had a 24% increase in the density of the dopamine transporter in some [brain regions](#), which after treatment was significantly higher than in adults without ADHD who had not been treated with the drug. Prior to the 12-month treatment, there were no significant differences in the two groups' dopamine transporter levels. The authors conclude that the elevated dopamine transporter density, suggested by some as a biological test for diagnosis of ADHD, may be a consequence of chronic treatment rather than a marker for the disorder. These findings may offer an explanation for discrepancies in the literature describing dopamine transporter levels in ADHD patients, as differences in dopamine transporter levels in the brain may be due to differences in prior treatment.

Many studies have shown that an acute increase in dopamine signaling

while on methylphenidate treatment can improve ADHD symptoms in the short term, but this is the first study to analyze the long-term effects of treatment.

More information: Wang G-J, Volkow ND, Wigal T, Kollins SH, Newcorn JH, et al. (2013) Long-Term Stimulant Treatment Affects Brain Dopamine Transporter Level in Patients with Attention Deficit Hyperactive Disorder. PLoS ONE 8(5): e63023.

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