

□ 1: [Nutr Neurosci](#). 2007 Jun-Aug;10(3-4):151-7.[Links](#)**Urinary catecholamines in children with attention deficit hyperactivity disorder (ADHD): modulation by a polyphenolic extract from pine bark (pycnogenol).**[Dvoráková M](#), [Jezová D](#), [Blazíček P](#), [Třebatická J](#), [Skodáček I](#), [Suba J](#), [Iveta W](#), [Rohdewald P](#), [Duracková Z](#).Department of Medical Chemistry, Biochemistry and Clinical Biochemistry, Faculty of Medicine, Comenius University, Bratislava, Slovak Republic.
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Our study tested the hypothesis that treatment with a potent polyphenol complex not only reduces hyperactivity of children, but also catecholamine excretion and oxidative stress. Urine catecholamine concentrations were measured in attention deficit hyperactivity disorder (ADHD) children and healthy controls. ADHD children received either placebo (PL) or Pycnogenol (Pyc), a bioflavonoid extract from the pine bark, for one month. The study was performed in a randomized, double-blind, PL controlled design. Concentrations of catecholamines were higher in urine of ADHD patients compared to those of healthy children. Moreover, noradrenaline (NA) concentrations positively correlated with degree of hyperactivity of ADHD children. **In ADHD patients, adrenaline (A) and NA concentrations positively correlated with plasma levels of oxidized glutathione. The treatment of ADHD children with Pyc caused decrease of dopamine (D) and trend of A and NA decrease and increased GSH/GSSG ratio.** In conclusion, the data provide further evidence for the overactivity of the noradrenergic system in ADHD and demonstrate that A release may be increased, as well. Treatment of ADHD children with Pyc normalized catecholamine concentrations, leading to less hyperactivity, and, consequently, to reduced oxidative stress.

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