

sulfite oxidase deficiencies. (Struys EA, Nota B, Bakkali A, et al. **Pediatrics** 2012 Dec;130(6):e1716-9).

ATTENTION DEFICIT AND AUTISTIC DISORDERS

FUNCTIONAL MAGNETIC RESONANCE IMAGING STUDIES OF INHIBITION AND ATTENTION IN ADHD

Researchers at King's College, London; Kyushu University, Japan; and Barcelona, Spain conducted a meta-analysis of functional magnetic resonance imaging (fMRI) in ADHD during inhibition and attention tasks, with reference to age and effects of long-term use of stimulant medication. Twenty-one data sets were included in the inhibition meta-analysis (7 adult and 14 pediatric samples), and 13 data sets in the attention meta-analysis (2 adult and 11 pediatric samples). Combined, the inhibition studies included 287 patients with ADHD and 320 healthy controls. Compared to controls, patients with ADHD showed reduced activation for inhibition in the right inferior frontal cortex, supplementary motor area, anterior cingulate cortex, and striato-thalamic areas, and reduced activation for attention in the right dorsolateral prefrontal cortex, posterior basal ganglia, thalamic and parietal regions. Long-term stimulant medication use was associated with more normal right caudate activation during the attention domain. For the inhibition meta-analysis only, the supplementary motor area and basal ganglia were under-activated in children with ADHD, while the inferior frontal cortex and thalamus were under-activated solely in adults with ADHD relative to controls. (Hart H, Radua J, Nakao T, Matai-Cols D, Rubia K. Meta-analysis of functional magnetic resonance imaging studies of inhibition and attention in attention-deficit/hyperactivity disorder. **JAMA Psychiatry** 2013 Feb;70(2):185-198). (Response: Dr Katya Rubia. E-mail: katya.rubia@kcl.ac.uk).

COMMENT. In conclusion, patients with ADHD have cognitive dysfunctions in right fronto-basal ganglia-thalamic networks, and long-term stimulant medication is associated with normalization of right caudate deficits during attention. In addition to inhibition and attention studies, future meta-analyses should include other compromised functions such as timing and motivation. In the present study, for the inhibition domain, go/no-go, stop tasks and Stroop tasks were used, and for the attention domain, tasks that measured visuospatial selective attention, sustained attention, and flexible attention.

SELECTIVE DOPAMINE REUPTAKE INHIBITOR AND ADHD

ADHD treatments act as dual norepinephrine (NE) and dopamine (DA) reuptake inhibitors (psychostimulants) or selective NE reuptake inhibitors (SNRIs). Bzptropine analogs (AHN2-005) act as highly selective DA reuptake inhibitors while lacking the abuse potential of psychostimulants. A cognition-enhancing dose of AHN 2-005 increased levels of DA and NE in the prefrontal cortex (PFC) and may be effective in the treatment of ADHD associated with PFC dysfunction. (Schmeichel BE et al. **Neuropharmacology** 2013 Jan;64:321-8). Neuropharmacology and fMRI studies should expand the development of new, more effective agents in the treatment of ADHD.