Improved prefrontal activity in AD/HD children treated with atomoxetine: A NIRS study.

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Abstract

Background/Aims: Atomoxetine (ATX), a selective norepinephrine reuptake inhibitor, is the first approved non-stimulant drug for treatment of attention deficit/hyperactivity disorder (AD/HD). The present study examined the effects of long-term treatment with ATX on prefrontal hemodynamic activity in AD/HD children during a continuous performance task (CPT) using near-infrared spectroscopy (NIRS).

Methods: Prefrontal hemodynamic activity was measured in 12 children with AD/HD during experimental sessions conducted before and 6 months or more after starting ATX treatment. The average maintenance dose of ATX was 1.6 mg/kg/day. Fourteen age-matched typically developing children participated as a control group.

Results: In the control group, the CPT induced a significant increase in oxygenated hemoglobin (oxy-Hb) concentration in the bilateral dorsolateral prefrontal cortex (DLPFC). In the AD/HD group in the pre-ATX condition, the CPT did not induce a significant increase in oxy-Hb concentration in any of the NIRS channels, but induced a significant decrease in oxy-Hb concentration in the left ventrolateral prefrontal cortex (VLPFC). In the AD/HD group in the post-ATX condition, significant activation was observed in the right DLPFC and the decrease in oxy-Hb concentration in the left VLPFC disappeared.

Conclusions: These results suggest that long-term treatment with ATX improved prefrontal hemodynamic activity in AD/HD children, and NIRS may be useful for assessment of the prefrontal hemodynamic response to ATX treatment.