Oculomotor Abnormalities in Children with Attention-Deficit/Hyperactivity Disorder Are Improved by Methylphenidate

Bucci Maria Pia, Stordeur Coline, Septier Mathilde, Acquaviva Eric, Peyre Hugo, and Delorme Richard.


ABSTRACT

Background: There are relatively few studies of saccadic eye movements in children with attention-deficit/hyperactivity disorder (ADHD). The aim of this study was to examine inhibitory abilities of eye movements in children with ADHD and to explore the effect of methylphenidate (MPH) on eye movement performance.

Methods: Thirty-one children with ADHD (mean age 9.9 ± 0.4 years) and 31 sex-, age-, and IQ-matched children with normal development were examined. Saccades elicited not only by the gap, step, overlap, and antisaccade paradigms but also a simple fixation paradigm have been recorded using an eye tracker. The latency of each type of saccade, the error rate of antisaccades, and the number of saccades made during fixation have been measured.

Results: Children with ADHD and naive to treatment with respect to controls showed significantly shorter mean latency of voluntary saccades (overlap paradigm), more frequent errors during the antisaccade paradigm, and higher number of saccades made during fixation. After 1 month of MPH treatment, all these parameters changed significantly and reached control values.

Conclusion: Taken together, these results suggest that oculomotor abilities are poor in children with ADHD, which may correlate with deficits in inhibitory mechanisms. Treatment with MPH improves oculomotor performances through adaptive strategies, which may involve brain structures related to cognitive inhibition.