Abstract

Objective
Approximately 30% of children and adolescents diagnosed with attention-deficit/hyperactivity disorder (ADHD) and treated with stimulants are considered non-responders (non-REs). Reliable predictors of response are missing. We examined changes in Event-Related Potentials (ERPs) induced by a single dose of stimulant medication in order to predict later clinical response.

Methods
ERPs were registered twice during performance of a visual cued go/no-go task in 87 ADHD patients (27 girls) aged 8–18 years; the second recording on a single dose of stimulant medication, followed by a systematic medication trial lasting 4 weeks. Based on the four-week trial, participants were categorized as responders (REs, N=62) or non-REs (N=25). Changes among REs and non-REs in ERP components (cueP3, CNV, P3go, N2no-go, P3no-go) and behavioral-test variables were then compared.

Results
REs and non-REs differed significantly in medication-induced changes in P3no-go, cue-P3, CNV, omission errors, reaction time, and reaction-time variability. The largest effect size was found for P3no-go amplitude (p < .001; d=1.76). Changes in P3no-go and omission errors correctly classified 90% of the REs and 76% of the non-REs, when controlling for the age of the participants.

Conclusion
Clinical response to stimulants can be predicted by assessing single-dose changes in the P3no-go ERP component amplitude.