Effects of Neurofeedback Training on Performing Bimanual Coordination In-phase and Anti-phase Patterns in Children with ADHD

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Abstract

It is generally accepted that children with attention-deficit/hyperactivity disorder (ADHD) have poor motor control, especially in bimanual coordination tasks. Such children characteristically have impaired fine motor ability, problems with force control, and poor motor coordination. They are at particular risk of loss of motor control and reduced bimanual coordination. We tested whether, compared to a control condition, neurofeedback training (NFT) could improve bimanual coordination among children with ADHD. 20 Children with ADHD (mean age 7.9 years; SD 2.11) were randomly assigned either to NFT or to a control condition. All participants completed a bimanual coordination test at the following time points: baseline, assessment 1, assessment 2, assessment 3, and again 12 session later at posttest. NFT consisted of Sensory Motor Rhythm (SMR) training to achieve increased SMR in C3 and C4, while participants in the control condition were under mock NFT conditions. Bimanual coordination accuracy and consistency improved from baseline to completion of the intervention (significant Time effect), but in the NFT condition (significant time × group interaction). Compared to the control condition, the NFT group had fewer errors in both patterns of bimanual coordination (significant Group effect). Among children with ADHD, SMR neurofeedback training (NFT) led to significant improvements in a bimanual coordination task. The SMR NFT thus appears to have the potential to improve and enhance the motor control of ADHD patients.