The utility of quantitative electroencephalography and Integrated Visual and Auditory Continuous Performance Test as auxiliary tools for the Attention Deficit Hyperactivity Disorder diagnosis

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Objective
This study investigated the clinical utility of quantitative electroencephalography (QEEG) and the Integrated Visual and Auditory Continuous Performance Test (IVA + CPT) as auxiliary tools for assessing Attention Deficit Hyperactivity Disorder (ADHD).

Methods
All of 157 subjects were assessed using the Korean version of the Diagnostic Interview Schedule for Children Version IV (DISC-IV). We measured EGG absolute power in 21 channels and conducted IVA+CPT. We analyzed QEEG according to the Hz range: delta (1-4Hz), theta (4-8Hz), slow alpha (8-10Hz), fast alpha (10-13.5Hz), and beta (13.5-30Hz). To remove artifacts, independent component analysis was conducted (ICA), and the tester confirmed the results again.

Results
All of the IVA + CPT quotients showed significant differences between the ADHD and control groups. The ADHD group showed significantly increased delta and theta activity compared with the control group. The z-scores of theta were negatively correlated with the scores of IVA + CPT in ADHD combined type, and those of beta were positively correlated.

Conclusions
IVA + CPT and QEEG significantly discriminated between ADHD and control groups. The commission error of IVA + CPT showed an accuracy of 82.1%, and the omission error of IVA + CPT showed an accuracy of 78.6%.

Significance
The IVA + CPT and QEEG are expected to be valuable tools for aiding ADHD diagnosis accurately.