


Abstract

OBJECTIVE:
To establish valid, objective biomarkers for ADHD using machine learning.

METHOD:
Machine learning was used to predict disorder severity from new brain function data, using a support vector machine (SVM). A multicenter approach was used to collect data for machine learning training, including behavioral and physiological indicators, age, and reverse Stroop task (RST) data from 108 children with ADHD and 108 typically developing (TD) children. Near-infrared spectroscopy (NIRS) was used to quantify change in prefrontal cortex oxygenated hemoglobin during RST. Verification data were from 62 children with ADHD and 37 TD children from six facilities in Japan.

RESULTS:
The SVM general performance results showed sensitivity of 88.71%, specificity of 83.78%, and an overall discrimination rate of 86.25%.

CONCLUSION:
A SVM using an objective index from RST may be useful as an auxiliary biomarker for diagnosis for children with ADHD.