

Clinical Validation of Eye Vergence as an Objective Marker for Diagnosis of ADHD in Children

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Abstract

Objective:

ADHD youth show poor oculomotor control. Recent research shows that attention-related eye vergence is weak in ADHD children.

Method:

To validate vergence as a marker to classify ADHD, we assessed the modulation in the angle of vergence of children ($n = 43$) previously diagnosed with ADHD while performing an attention task and compared the results with age-matched clinical controls ($n = 19$) and healthy peers ($n = 30$).

Results:

We observed strong vergence responses in healthy participants and weak vergence in the clinical controls. ADHD children showed no significant vergence responses. Machine-learning models classified ADHD patients ($n = 21$) from healthy controls ($n = 21$) with an accuracy of 96.3% (false positive [FP]: 5.12%; false negative [FN]: 0%; area under the curve [AUC]: 0.99) and ADHD children ($n = 11$) from clinical controls ($n = 14$) with an accuracy of 85.7% (FP: 4.5%; FN: 19.2%, AUC: 0.90).

Conclusion:

In combination with an attention task, vergence responses can be used as an objective marker to detect ADHD in children.