

Caudal F. New marker using bioimpedance technology in screening for Attention Deficit/Hyperactivity Disorder (ADHD) in Children as adjunct to conventional diagnostic methods.

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Background: Diagnosis of attention deficit/hyperactivity disorder (ADHD) in children is not straightforward and misdiagnosis may occur, which leads to the possibility of errors in treatment, with numerous possible side effects that could be especially damaging in view of the age of the population. For this reason, a tool that is easy to use, fast, and cost-effective, which provides an addition to conventional diagnosis and treatment monitoring of ADHD children, is needed. In this study, electro interstitial scans (EIS) were used to perform bioimpedance measurements.

The results of conductivity measurements taken using forehead electrodes in a group of children conventionally diagnosed with ADHD and in a control group not showing any symptoms of ADHD were compared.

Method: Sixty children without any ADHD symptoms (group 1) and 52 children diagnosed with ADHD following psychiatric examination (group 2) underwent an examination with the EIS system. Statistical analysis was performed to compare the conductivity measurements at the level of the forehead electrodes, using independent *t*-tests and a receiver-operating characteristic curve (ROC) to determine the specificity and sensitivity of the test.

Results: The mean of the conductivity measurements of two pathways between the forehead electrodes (from left forehead to right forehead and from right forehead to left forehead) in the ADHD group was 33.11 micro Siemens (mS) (range 2–113 mS). This was significantly higher ($P < 0.001$) than mean of the conductivity measurements of two pathways between the forehead electrodes of the control group (2.75 mS, range 1.75–27.4 mS).

In terms of the ROC results, comparing the two groups using the reference of the mean of conductivity measurements of the two pathways between the forehead electrodes, the test showed a specificity of 98% and sensitivity of 80% and $P = 0.0001$ (95% confidence interval) with a cutoff value at 7.4 mS.

Conclusion: The EIS marker related to the conductivity measurements of the forehead pathway has a high specificity and high sensitivity and use of this could provide practitioners with a noninvasive, low-cost system that is easy to use in the office and could offer an adjunct to the conventional diagnosis of ADHD children. It could also assist in treatment monitoring, and allow for earlier intervention.