Does ADHD exists? Unfortunately yes! What is more, the prevalence of this disorder is assessed for 5% of school-age children and it is one of the most commonly diagnosed neurodevelopmental disorder. Even though lots of studies investigates causes of the disorder, still little is known about its etiology.

RESEARCH GOAL

The main goal of this project is to improve our understanding of age-related changes in symptoms of Attention Deficit Hyperactivity Disorder (ADHD) on behavioral and electrophysiological level. Recent research indicates that ADHD is related to some developmental trends since its symptoms change widely over time. Nevertheless, there are divergent opinions whether ADHD is related to deviation in brain development or to delayed brain maturation. The proposed project will allow for gaining evidence in favor of one or another theory of ADHD causes (brain deviation vs. delayed maturation) in one framework. We plan to combine two well-established, but so far separately used approaches, to investigate ADHD. We will investigate resting-state EEG activity and we will use clinical battery of tests measuring several attention processes (Test of Everyday Attention for Children, TEA-Ch), both used in clinical assessment. Additionally, we will record EEG signal during task performance, which measures attentional networks functioning as proposed by Posner's theory Attention Network Test (ANT), and we will investigate sustained attention using Sustained Attention to Response Test (SART) task. These methods are characteristic for cognitive neurosciences approach. This is a very novel approach, which will integrate different EEG and behavioral data in the context of complex statistical models. Such data modeling is intended to provide analyses explaining relationship between brain activity and behavioral performance and changes related to development.

METHOD

Two groups will be compared: clinical group consisting of children diagnosed with ADHD (N = 80), and control group (N = 80) consisting of healthy children matched to clinical participants in respect of age, sex, and educational level. All participants will fit age range from 8 to 16 years old. During one session EEG and behavioral data will be collected. We will collect resting-state EEG activity during eyes open/eyes closed session and task-related EEG during ANT performance. Additionally we will assess attention processes using clinical battery of tests TEA-Ch and SART.

REASON AND EFFECTS

There is a lack of research on ADHD, which would provide such a wide range of both brain and behavioral measurements to investigate developmental trend in ADHD symptoms. What is more, previous studies investigated smaller and less precisely matched groups, usually comparing very broad populations ie. younger / older patients. Successful completion of the project will improve knowledge about developmental aspects of ADHD and will bring new evidence to solve controversy about the causes of ADHD. Additionally, the results of the project also have significant potential for practical applications such as development of more precise diagnostic tests and monitoring and optimizing therapy of this one of the most frequent neurodevelopmental disorder.