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Young adults with ADHD may display unique physiological signs that could lead to accurate diagnosis

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Young adults diagnosed with ADHD may display subtle physiological signs that could lead to a more precise diagnosis, according to Penn State researchers.

In a recent study, young adults with ADHD, when performing a continuous motor task, had more difficulty inhibiting a motor response compared to young adults who did not have ADHD. The participants with ADHD also produced more force during the task compared to participants without ADHD.

Attention-deficit/hyperactivity disorder (ADHD) is a common childhood disorder that can continue to affect up to 65 percent of these children as they become adults, according to the researchers.

"A large group of individuals have the label 'ADHD,' but present with different symptoms," said Kristina A. Neely, assistant professor, kinesiology. "One of the goals of our ADHD research is to discover unique physiological signals that may characterize different subgroups of the disorder."

Previous studies have shown that some individuals with ADHD may have poor control of their motor systems, but until recently, the way that it was measured was not very sensitive.

"In previous tasks, motor and cognitive function was evaluated with a key-press response: You hit the button or you didn't," said Neely. "We measure precisely how much force an individual is producing during a continuous motor task. This type of task provides us with more information than the dichotomous 'yes/no' response."

In a recent study using a continuous motor task, participants produced force with their index finger and thumb in response to cues on a visual display. Participants were instructed to produce force when the visual cue was any color except blue. In the "blue" trials, participants were told to withhold force production.

Neely and colleagues found that participants with ADHD symptoms produced more force on trials when they were told to withhold a response, compared to those without ADHD. Further, the amount of force that was produced during these trials was correlated with specific ADHD-related symptoms. The researchers present their findings at the annual Society for Neuroscience meeting today (Nov. 15).

"The use of a precise and continuous motor task provides a more nuanced understanding of inhibitory control, compared to a button-press task," said Neely. "We found that young adults with ADHD produced more force on the 'blue' trials compared to young adults without ADHD. And the amount of force produced was related to self-report of ADHD-related symptoms of inattention, hyperactivity and impulsivity. Moving forward, we will manipulate the parameters of our force-production task to determine which aspects of motor control are related to specific symptoms."

Understanding the impact of particular types of ADHD and their effect on motor function could lead to more targeted diagnoses -- which could aid in determining optimal treatment options for patients based on their specific symptom profile.

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