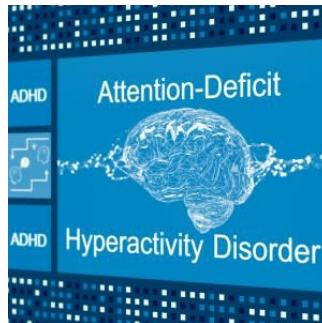

Harnessing AI for Improved Diagnosis of ADHD in Adolescents



The results of a new study, presented at RSNA 2023, indicated significant differences in nine brain white matter tracts in individuals with ADHD. The discovery was made through using AI to analyse specialised brain MRI scans of adolescents with and without attention-deficit/hyperactivity disorder (ADHD).

ADHD can manifest at an early age and can profoundly impact an individual's quality of life. It is also becoming increasingly prevalent in society today, especially with the proliferation of smartphones, contributing to increased distractions.

Researchers are addressing a critical gap by aiming to establish a more objective metric for diagnosis. Unfortunately, ADHD is difficult to diagnose and relies on subjective self-reported surveys.

This is the first study to employ deep learning for identifying markers of ADHD in the multi-institutional Adolescent Brain Cognitive Development (ABCD) Study. The study includes brain imaging, clinical surveys, and other data on over 11,000 adolescents across 21 research sites in the U.S. The brain imaging data incorporates a specialised type of MRI known as diffusion-weighted imaging (DWI).

The research team opted for a cohort of 1,704 individuals from the ABCD dataset, including both adolescents with and without ADHD. Using DWI scans, they derived fractional anisotropy (FA) measurements along 30 major white matter tracts in the brain—a metric indicating how water molecules move along these fibers.

The input for training a deep-learning AI model involved FA values from 1,371 individuals. This model was subsequently tested on a separate set of 333 patients, encompassing those diagnosed with and without ADHD.

Leveraging AI assistance, the researchers uncovered a significant elevation in FA values within nine white matter tracts in patients diagnosed with ADHD.

Study co-author Justin Huynh, M.S., a research specialist in the Department of Neuroradiology at the University of California, summarised, "these differences in MRI signatures in individuals with ADHD have never been seen before at this level of detail,"

"In general, the abnormalities seen in the nine white matter tracts coincide with the symptoms of ADHD".

Source: [RSNA](#)

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