ADHDの小児においては脳の機能的パスウェイが障害されている（Abstract＃LL-PDS-SU1A）

ADHDのマーカーとなりうる検査結果が脳の異常を示したfMRIから明らかにされた

Potential biomarker for ADHD revealed though fMRI study that identified brain abnormalities

機能的磁気共鳴画像（fMRI）を用いた結果、注意欠陥多動性障害（ADHD）のバイオマーカーとなりうる小児の脳の異常が同定されたとのスタディ結果が、2011年Radiological Society of North America学会で発表された。研究者らは典型的な発育過程にある小児18人およびADHDと診断された小児18人（9歳～15歳）にfMRIを施行した。fMRIを行う一方で小児らは注意力を持続する検査（1組の3つの数を見せたあとに次の数字群が元の組にマッチしているか否かを尋ねる）に参加した。各々の対象に対しfMRIにより脳活性化マップが作成され、小児が課題を行っている間にどの脳部位が活性化するかが示された。正常なコントロール群と比較し、ADHDの小児は視覚的な注意情報を処理するのに関わるいくつかの脳領域の機能的活性が異常であることが示された。ADHDの小児の視覚皮質と前頭前皮質との機能的連結性に障害が存在することが明らかにされた。このスタディは予備的ではあるが、今回の結果は、ADHDにおいて視覚刺激がないための作業記憶の欠損の基盤となっている可能性がある。

Full Text

Using functional magnetic resonance imaging (fMRI), researchers have identified abnormalities in the brains of children with attention deficit hyperactivity disorder (ADHD) that may serve as a biomarker for the disorder, according to a study presented at the annual meeting of the Radiological Society of North America (RSNA).

According to the National Institute of Mental Health in the United States, there is no single test capable of diagnosing a child with ADHD. As a result, difficult children are often incorrectly labeled with he disorder while other children with the disorder remain undiagnosed.

"Diagnosing ADHD is very difficult because of its wide variety of behavioral symptoms," said lead researcher Xiaobo Li, Ph.D., assistant professor of radiology at the Albert Einstein College of Medicine in New York. "Establishing a reliable imaging biomarker of ADHD would be a major contribution to the field."

For the study, Dr. Li and colleagues performed fMRI on 18 typically developing children and 18 children diagnosed with ADHD (age range 9 to 15 years). While undergoing fMRI, the children engaged in a test of sustained attention in which they were shown a set of three numbers and then asked whether subsequent groups of numbers matched the original set. For each participant, fMRI produced a brain activation map that revealed which regions of the brain became activated while the child performed the task. The researchers then compared the brain activation maps of the two groups.

Compared to the normal control group, the children with ADHD showed abnormal functional activity in several regions of the brain involved in the processing of visual attention information. The researchers also found that communication among the brain regions within this visual attention-processing pathway was disrupted in the children with ADHD.

"What this tells us is that children with ADHD are using partially different functional brain pathways to process this information, which may be caused by impaired white matter pathways involved in visual attention information processing," Dr. Li said.

Dr. Li said much of the research conducted on ADHD has focused on the impulsivity component of the disorder.

"Inattention is an equally important component of this disorder," she said, "and our findings contribute to understanding the pathology of inattentiveness in ADHD."

Coauthors are Shugao Xia, Ariane Kimball and Craig Branch, Ph.D.

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