

Complexity Analysis of Resting-State fMRI in Adult Patients with Attention Deficit Hyperactivity Disorder: Brain Entropy.

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Abstract

OBJECTIVE:

Complexity analysis of functional brain structure data represents a new multidisciplinary approach to examining complex, living structures. I aimed to construct a connectivity map of visual brain activities using resting-state functional magnetic resonance imaging (fMRI) data and to characterize the level of complexity of functional brain activity using these connectivity data.

METHODS:

A total of 25 healthy controls and 20 patients with attention deficit hyperactivity disorder (ADHD) participated. fMRI preprocessing analysis was performed that included head motion correction, temporal filtering, and spatial smoothing process. Brain entropy (BEN) was calculated using the Shannon entropy equation.

RESULTS:

My findings demonstrated that patients exhibited reduced brain complexity in visual brain areas compared to controls. The mean entropy value of the ADHD group was 0.56 ± 0.14 , compared to 0.64 ± 0.11 in the control group.

CONCLUSION:

My study adds an important novel result to the growing literature pertaining to abnormal visual processing in ADHD that my ADHD patients had lower BEN values, indicating more-regular functional brain structure and abnormal visual information processing.