Functional Brain Connectivity Differences Between Different ADHD Presentations: Impaired Functional Segregation in ADHD-Combined Presentation but not in ADHD-Inattentive Presentation

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Abstract:

Introduction:
Contrary to Diagnostic and Statistical Manual of Mental Disorders (DSM-5), fifth edition, some studies indicate that ADHD-inattentive presentation (ADHD-I) is a distinct diagnostic disorder and not an ADHD presentation.

Methods:
In this study, 12 ADHD-combined presentation (ADHD-C), 10 ADHD-I, and 13 controls were enrolled and their resting state EEG recorded. Following this, a graph theoretical analysis was performed and functional integration and segregation of brain network was calculated.

Results:
The results show that clustering coefficient of theta band was significantly different among three groups and significant differences were observed in theta global efficiency between controls and ADHD-C. Regarding the alpha band, a lower clustering coefficient was observed in control subjects. In the beta band, clustering coefficient was significantly different between the control and children with ADHD-C and also between ADHD-I and ADHD-C. The clustering coefficient, in the subjects with ADHD-C, demonstrated a rapid decline and was significantly lower than the subjects with ADHD-I and control.

Conclusion:
Decreased clustering, in high thresholds, may be associated with hyperactivity while increased segregation in low thresholds with inattentiveness. A different functional network occurs in the ADHD-C brain that is consistent with several studies that have reported ADHD-I as a distinct disorder.