Neural Correlates of Default Mode Network Connectivity in Children with Attention Deficit and Hyperactivity Disorder

G. Benli, Serife; Icer, Semra; Gumus, Kazim; Ozmen, Sevgi; Doganay, Selim; Koc, Gonca; B. Oztop, Didem; Coskun, Abdulhakim

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Abstract:

The Purpose:
The objective of this study is to explore neural correlates of Default Mode Network (DMN) regions in children with attention deficit and hyperactivity disorder (ADHD) using resting-state functional magnetic resonance imaging (rs-fMRI).

Methods:
The study included ten children with ADHD (aged between 9 and 16) and ten age-matched controls. Four DMN regions (medial prefrontal cortex (MPFC), the posterior cingulate cortex (PCC), left and right inferior parietal lobes (IPL) and the corresponding Broadmann areas in each one were used as seeds and their functional connectivity with the whole brain was explored and compared between ADHD and control groups using t-test (p<0.05).

Results:
We observed that when DMN regions were selected as seeds, the connected regions were different between two groups and were mostly in the right hemisphere in ADHD patients contrary to the left hemisphere in the control group.

Conclusion:
In conclusion, neural correlates of DMN regions differ in ADHD patients compared to healthy controls. Our findings suggest that in ADHD patients, DMN regions show more connectivity with the right hemisphere of the brain whereas the left hemisphere is more functionally connected with DMN in health controls. Further research is required to explore this atypical DMN connectivity in ADHD using larger cohort.