A multi-parameter resting-state functional magnetic resonance imaging study of brain intrinsic activity in attention deficit hyperactivity disorder children


Abstract

A great number of studies have demonstrated functional abnormalities in children with attention-deficit/hyperactivity disorder (ADHD), although conflicting results have also been reported. And few studies analyzed homotopic functional connectivity between hemispheres. In this study, resting-state functional magnetic resonance imaging (fMRI) data were recorded from 45 medication-naïve ADHD children and 26 healthy controls. The regional homogeneity (ReHo), degree centrality (DC) and voxel-mirrored homotopic connectivity (VMHC) values were compared between the two groups to depict the intrinsic brain activities. We found that ADHD children exhibited significantly lower ReHo and DC values in the right middle frontal gyrus and the two values correlated with each other; moreover, lower VMHC values were found in the bilateral occipital lobes of ADHD children, which was negatively related with anxiety scores of Conners' Parent Rating Scale (CPRS-R) and positively related with completed categories of Wisconsin Card Sorting Test (WCST). Our results might suggest that less spontaneous neuronal activities of the right middle frontal gyrus and the bilateral occipital lobes in ADHD children.