Abstract: The aim of this study is confirmation of an abnormal regional cerebral blood flow (rCBF) pattern in high-functioning autism (HFA). Confirmation of an abnormal rCBF pattern in HFA may be useful for elucidation of its pathophysiology and a differential diagnosis, such as with attention-deficit/hyperactivity disorder (AD/HD). Brain 99mTc-ECD SPECT was performed in 16 cases of HFA. The HFA group consisted of 16 cases of HFA. They were all male, with an IQ of 76–126. They had normal brain MRI findings, and had an age of 9–14 years. We examined abnormal rCBF in HFA by comparing the results to those in the control group. The control group consisted of 1 male and 4 females cryptogenic epilepsy patients with normal intelligence. They have no problems in learning at school or mental or behavioral traits. They had normal brain MRI or SPECT findings, and had an age of 7–15 years. 3-dimensional stereotactic ROI template (3DSRT) was used to analyze SPECT data. We calculated the ‘relative rCBF (%)’ (RI count of each segment / 100 / Sum of RI count of the corresponding hemisphere), and compared the values between the two groups. We found a significantly low ‘relative rCBF (%)’ in the left temporal region in the HFA group. We also calculated the L/R ratio (the ‘relative rCBF (%)’ of a segment on the left side / the ‘relative rCBF (%)’ of the corresponding segment on the right side), and compared the value for each segment between the two groups. There were no significant differences in any segments between the two groups. We also checked for differences in the ‘relative rCBF (%)’ between segments on the right side and corresponding segments on the left side in both the HFA and control groups. We found significant right<left perfusion in the angular region and significant left<right perfusion in the pericallosal, thalamus, and hippocampus region in the HFA group. We also found significant right<left perfusion in the temporal region in the control group. Significant hypoperfusion in the left temporal region due to an unidentified underlying brain pathology and abnormal laterality in the angular, temporal (lack of right<left perfusion), pericallosal, thalamus, and hippocampus regions may influence the symptoms of autism.

Keywords: 99mTc-ECD SPECT, high-functioning autism, rCBF, 3DSRT
Brain SPECT in high-functioning autism

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