

Abstract

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Asperger syndrome: a proton magnetic resonance spectroscopy study of brain.

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BACKGROUND: Asperger syndrome (AS; an autistic disorder) is associated with impaired social skills and obsessional/repetitive behavior. Patients with autism have significant abnormalities in the frontal lobe and frontoparietal connectivity. Nobody has examined the relationship between abnormalities in the frontal and parietal lobes and clinical symptoms in people with AS.

METHODS: We used in vivo proton magnetic resonance spectroscopy to examine neuronal integrity of the medial prefrontal and parietal lobes in 14 non-learning-disabled adults with AS and 18 control subjects (of similar sex, age, and IQ). We obtained measures of the prefrontal lobe in 11, the parietal lobe in 13, and both lobes in 10 subjects with AS. We measured concentrations and ratios of N-acetylaspartate (NAA), creatine and phosphocreatine (Cr + PCr), and choline (Cho). Levels of NAA, Cr + PCr, and Cho are indicators of neuronal density and mitochondrial metabolism, phosphate metabolism, and membrane turnover. Frontal metabolite levels were correlated with scores on the Yale-Brown Obsessive Compulsive Scale and the Autism Diagnostic Interview.

RESULTS: Subjects with AS had a significantly higher prefrontal lobe concentration of NAA ($z = -3.1$; $P = .002$), Cr + PCr ($z = -2.2$; $P = .03$), and Cho ($z = -2.9$; $P = .003$). Increased prefrontal NAA concentration was significantly correlated with obsessional behavior ($\tau = 0.67$; $P = .005$); increased prefrontal concentration of Cho, with social function ($\tau = 0.72$; $P = .02$). We found no significant differences in parietal lobe metabolite concentrations.

CONCLUSION: Subjects with AS have abnormalities in neuronal integrity of the prefrontal lobe, which is related to severity of clinical symptoms.

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