

fMRI of parents of children with Asperger Syndrome: A pilot study.

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BACKGROUND: People with autism or Asperger Syndrome (AS) show altered patterns of brain activity during visual search and emotion recognition tasks. Autism and AS are genetic conditions and parents may show the 'broader autism phenotype.'

AIMS: (1) To test if parents of children with AS show atypical brain activity during a visual search and an empathy task; (2) to test for sex differences during these tasks at the neural level; (3) to test if parents of children with autism are hyper-masculinized, as might be predicted by the 'extreme male brain' theory.

METHOD: We used fMRI during a visual search task (the Embedded Figures Test (EFT)) and an emotion recognition test (the 'Reading the Mind in the Eyes' (or Eyes) test).

SAMPLE: Twelve parents of children with AS, vs. 12 sex-matched controls.

DESIGN: Factorial analysis was used to map main effects of sex, group (parents vs. controls), and sexxgroup interaction on brain function. An ordinal ANOVA also tested for regions of brain activity where females>males>fathers=mothers, to test for parental hyper-masculinization.

RESULTS ON EFT TASK: Female controls showed more activity in extrastriate cortex than male controls, and both mothers and fathers showed even less activity in this area than sex-matched controls. There were no differences in group activation between mothers and fathers of children with AS. The ordinal ANOVA identified two specific regions in visual cortex (right and left, respectively) that showed the pattern Females>Males>Fathers=Mothers, both in BA 19.

RESULTS ON EYES TASK: Male controls showed more activity in the left inferior frontal gyrus than female controls, and both mothers and fathers showed even more activity in this area compared to sex-matched controls. Female controls showed greater bilateral inferior frontal activation than males. This was not seen when comparing mothers to males, or mothers to fathers. The ordinal ANOVA identified two specific regions that showed the pattern Females>Males>Mothers=Fathers: left medial temporal gyrus (BA 21) and left dorsolateral prefrontal cortex (BA 44).

CONCLUSIONS: Parents of children with AS show atypical brain function during both visual search and emotion recognition, in the direction of hyper-masculinization of the brain. Because of the small sample size, and lack of age-matching between parents and controls, such results constitute a pilot study that needs replicating with larger samples.

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