

A MRI, MRS, fMRI, neuropsychological, and psychiatric assessment of children with fetal alcohol spectrum disorders.

Part I: FASD diagnostic and neuropsychological/psychiatric contrasts

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ABSTRACT

Magnetic resonance (MR) technology offers non-invasive methods for in vivo assessment of neuroabnormalities. A comprehensive neuropsychological/psychiatric, MR imaging, (MRI), MR spectroscopy (MRS), and functional MRI (fMRI) assessment was administered to children with fetal alcohol spectrum disorders (FASD) to determine if global and/or focal abnormalities could be identified across the spectrum. The four study groups included: 1) FAS/Partial FAS; 2) Static Encephalopathy/Alcohol Exposed (SE/AE); 3) Neurobehavioral Disorder/Alcohol Exposed (ND/AE) diagnosed with the FASD 4-Digit Code; and 4) healthy peers with no prenatal alcohol exposure. Results are presented in a series of four reports: Part 1: FASD diagnostic and neuropsychological/psychiatric contrasts (presented here); Part II: MRI; Part III: MRS, and Part IV: fMRI. Part I serves two purposes: 1) to confirm four clinically and statistically distinct study groups were successfully established, and 2) to provide a detailed sociodemographic, clinical, and psychological/psychiatric profile of each study group fundamental to the interpretation of the MRI, MRS, and fMRI results. A comprehensive, standardized assessment battery was administered to each child/caregiver by a psychologist masked to group assignment. The battery included soft neurologic signs, intellectual function, academic achievement, visuospatial skills, visual memory and organization, executive function, verbal memory, attention, receptive and expressive language, adaptive behavior, behavior problems and social competence, and psychiatric conditions. Neuropsychological and psychiatric impairments increased linearly as one advanced across the four study groups from Controls to ND/AE to SE/AE to FAS/PFAS. The FAS/PFAS group had significant neuropsychological impairment and the FAS facial phenotype. The SE/AE group had significant neuropsychological impairment (comparable to the FAS/PFAS group) and no FAS facial phenotype. The ND/AE group had no FAS facial phenotype and significantly less neuropsychological impairment than the FAS/PFAS and SE/AE groups, but significantly more impairment than the Control group. Compared to the Control group, the prevalence of attention deficit hyperactivity disorder, oppositional defiant disorder, and conduct disorder was significantly higher in the FASD groups.