A NEW METHOD FOR MEASURING CEREBELLAR VOLUME IN CHILDREN WITH COMPLEX NEURODEVELOPMENTAL DISORDERS.

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OBJECTIVE: Fully-automated computer methods of measuring regional brain differences in children with complex neurodevelopmental disorders (NDDs) are subject to systematic error. Software and anatomical atlases often based on typically-developing children's brains and structural differences in NDDs can be dramatic leading to further measurement error. Humans are more accurate error but much slower and fatigable. Here, we describe an ongoing project that includes a highly accurate manual segmentation of the cerebellum in children with chromosome 22q11.2 deletion syndrome (22q11.2DS).

Among many medical and cognitive symptoms, these children are at ultra-high risk for developing schizophrenia. The cerebellum is often smaller in children with 22q11.2DS. Smaller cerebellum is associated with problems with memory, emotion, and coordinated movement in 22q11.2DS (Bish et al., 2006). Smaller cerebellum is also seen in patients with schizophrenia (Andreasen and Pierson, 2008).

METHOD: We manually parcellated high-resolution T1-weighted MRI brain images of boys and girls ages 7 to 16 with (n=4) and without (n=2) 22q11.2DS. Using the Mango program, we manually traced voxel-based morphometry of the cerebellum.

RESULTS: Preliminary data indicates that cerebellum in children with 22q11.2DS is smaller than typically developing children.

CONCLUSIONS: We have processed 6 out of 30 available brains. We will continue to measure cerebellar volumes in all 30 datasets and then contrast these measures against automated voxel-based morphometry methods and then again using the *spatially unbiased atlas template of the cerebellum* developed by Diedrichsen (2006). Future studies will compare 22q11.2DS and TD children's cerebellar volumes in relation to prodromal symptoms of schizophrenia.

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