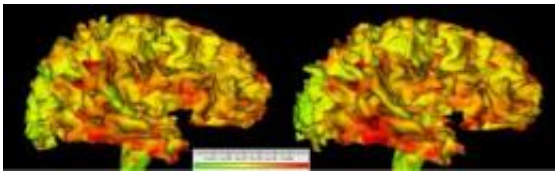


Study finds autism-related early brain overgrowth slows by age 2 years

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These images show brain maturation measured by cortical thickness for a representative subject with autism at age 2 (left) and age 4 (right). Thicker areas of cortex are shown in red, while thinner cortical areas are displayed in green. Credit: Image created by Clement Vachet, Neuro Image Research and Analysis Laboratories, UNC Department of Psychiatry.

Scientists using magnetic resonance imaging (MRI) observed that the brains of children with autism spectrum disorder are larger than those without autism, but this difference appears related to increased rates of brain growth before 2 years of age, according to a report in the May issue of *Archives of General Psychiatry*.

Autism researchers have long known of the connection between the [developmental disorder](#) and an increase in [brain size](#), although the cause and timing are not well defined. "The timing of brain enlargement in autism is of particular importance," note the authors of the present study. Other research has suggested "a period of typical development followed by the early postnatal onset of autistic disorder in the latter part of the first year or early second year of life." Linking the appearance of

symptoms with the period of rapid [brain growth](#) could provide information for investigating the causes of the disorder.

Heather Cody Hazlett, Ph.D., of the University of North Carolina, Chapel Hill, and colleagues evaluated 59 children with [autism spectrum disorder](#) (ASD) and 38 children who did not have an ASD diagnosis. The investigators conducted behavioral assessments and obtained MRIs of the participants' brains at age 2. Roughly two years later, when the children were 4 to 5 years old, the steps were repeated among a smaller group available for follow-up (36 children with an ASD diagnosis and 21 without). Scans were evaluated for the volume of gray and white matter in the brain, and the thickness of the brain cortex.

Children with ASD showed enlargement of the [cerebral cortex](#) volume at all ages studied. However, the rate of brain growth was similar to the rate seen in children who did not have ASD. Researchers noted that cortical thickness was similar in both groups but that the ASD group exhibited both a greater cortical surface area and an increase in white matter in the temporal lobe. The authors also found that there was "no increased rate of cerebral cortical growth during this age interval" (i.e., between age 2 years and age 4 to 5 years), suggesting that "increased brain volume at age 2, largely due to increased cerebral cortical volume, results from an increased rate of brain growth occurring before 2 years of age."

Based on these findings, the authors suggest that "brain overgrowth had its onset in the latter part of the first year of life," noting that "direct evidence of the timing of early brain volume overgrowth in autism will focus future studies on this narrow window of brain development." Further, the researchers state, identifying the timeframe when brain changes occur can help isolate "[brain](#) markers that may increase prediction of ASD risk."

More information: *Arch Gen Psychiatry*. 2011;68[5]:467-476.

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