

Imaging study finds evidence of brain abnormalities in toddlers with autism

4 May 2009

Toddlers with autism appear more likely to have an enlarged amygdala, a brain area associated with numerous functions, including the processing of faces and emotion, according to a report in the May issue of *Archives of General Psychiatry*, one of the JAMA/Archives journals. In addition, this brain abnormality appears to be associated with the ability to share attention with others, a fundamental ability thought to predict later social and language function in children with autism.

"Autism is a complex neurodevelopmental disorder likely involving multiple brain systems," the authors write as background information in the article. "Converging evidence from magnetic resonance imaging, head circumference and postmortem studies suggests that brain volume enlargement is a characteristic feature of autism, with its onset most likely occurring in the latter part of the first year of life." Based both on its function and studies of changes in its structure, the amygdala has been identified as a brain area potentially associated with autism.

Matthew W. Mosconi, Ph.D., and colleagues at the University of North Carolina at Chapel Hill conducted a [magnetic resonance imaging](#) study involving 50 autistic [children](#) and 33 control children. Participating children underwent brain scans along with testing of certain behavioral features of autism at ages 2 and 4. This included a measure of joint attention, which involves following another person's gaze to initiate a shared experience.

Compared to control children, those children with autism were more likely to have amygdala enlargement both at age 2 and age 4. "These findings suggest that, consistent with a previous report of head circumference growth rates in autism and studies of amygdala volume in childhood, amygdala growth trajectories are accelerated before age 2 years in autism and remain enlarged during early childhood," the

authors write. "Moreover, amygdala enlargement in 2-year-old children with autism is disproportionate to overall brain enlargement and remains disproportionate at age 4 years."

Among children with autism, amygdala volume was associated with an increase in joint attention ability at age 4. This suggests that alterations to this brain structure may be associated with a core deficit of [autism](#), the authors note.

"The amygdala plays a critical role in early-stage processing of facial expression and in alerting cortical areas to the emotional significance of an event," the authors write. "Amygdala disturbances early in development, therefore, disrupt the appropriate assignment of emotional significance to faces and social interaction." Continued follow-up of research participants, now under way, will help determine whether amygdala growth rates continue at the same rate or undergo another period of accelerated growth or a period of decelerated growth in autistic children after age 4.

More information: Arch Gen Psychiatry. 2009;66[5]:509-516.

Source: JAMA and Archives Journals ([news](#) : [web](#))

APA citation: Imaging study finds evidence of brain abnormalities in toddlers with autism (2009, May 4)
retrieved 27 April 2021 from
<https://medicalxpress.com/news/2009-05-imaging-evidence-brain-abnormalities-toddlers.html>

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