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Does the brain become unglued in autism?

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A new study published in *Biological Psychiatry* suggests that autism is associated with reductions in the level of cellular adhesion molecules in the blood, where they play a role in immune function.

Cell adhesion molecules are the glue that binds cells together in the body. Deficits in adhesion molecules would be expected to compromise processes at the interfaces between cells, influencing tissue integrity and cell-to-cell signaling. In the brain, deficits in adhesion molecules could compromise brain development and communication between nerve cells.

Over the years, deficits in neural cell adhesion molecules have been implicated in schizophrenia and other psychiatric disorders. One adhesion molecule, neurexin, is strongly implicated in the heritable risk for autism.

Cell adhesion molecules also play a crucial role in regulating immune cell access to the central nervous system. Prior research provided evidence of immune system dysfunction in individuals diagnosed with autism spectrum disorder (ASD). This led scientists from the University of California, Davis to examine whether adhesion molecules are altered in children with ASD.

To conduct the study, they recruited 2-4 year old children, 49 of whom were diagnosed with an ASD and 31 of whom were typically developing. They measured blood plasma levels of multiple molecules, conducted behavioral assessments, and measured head circumference in all participants.

"For the first time, we show that levels of soluble sPECAM-1 and sP-selectin, two molecules that mediate leukocyte migration, are significantly decreased in young children with ASD compared with typically developing controls of the same age," explained the authors. "This finding is consistent with previous reports of decreased levels of both sPECAM-1 and sP-selectin in adults with high-functioning autism."

They also found that repetitive behavior scores and sPECAM-1 levels were associated in children with ASD. Repetitive, stereotyped behaviors are a typical feature of ASD and these data suggest a potential relationship between molecule levels and the severity of repetitive behaviors.

Finally, they also discovered that head circumference was associated with increased sPECAM-1 levels in the typically developing children, but not in the children with ASD. This indicates that perhaps sPECAM-1 plays a role in normal brain growth, as larger head circumference is a known feature of individuals with autism.

"The report of reductions in adhesion molecules in blood in autism is interesting in light of recent genetic findings. However, the importance of these measurements remains somewhat uncertain," commented Dr. John Krystal, Editor of Biological Psychiatry. "Our field continues to look for blood tests that might inform the diagnostic and treatment process."

More information: The article is "Levels of Soluble Platelet Endothelial Cell Adhesion Molecule-1 and P-Selectin Are Decreased in Children with Autism Spectrum Disorder" by Charity E. Onore, Christine Wu Nordahl, Gregory S. Young, Judy A. Van de Water, Sally J. Rogers, and Paul Ashwood (doi: 10.1016/j.biopsych.2012.05.004). The article appears in Biological Psychiatry, Volume 72, Issue 12 (December 15, 2012)

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