

NEWS

Brain hormone levels linked to social deficits in autism

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Children with autism who have low brain levels of vasopressin have trouble understanding other people's thoughts. The findings, published 22 July in *PLoS One*, suggest that boosting the hormone's levels could improve social functioning in some children with autism¹.

Vasopressin plays a key role in the social behavior of animals. Its cousin hormone, oxytocin, which is similarly involved in trust, cooperation and social memory, has been **proposed as a treatment for autism**. The social effects of vasopressin seem to vary by gender, however. Blocking vasopressin's action in the brain leads to greater social deficits in male prairie voles than in female ones².

Such findings hint that vasopressin influences the social skills of boys more than those of girls. Because at least three times as many boys as girls have autism, lead researcher **Karen Parker**, associate professor of psychiatry and behavioral sciences at Stanford University in California, set out to investigate whether vasopressin plays a role in the disorder.

First, Parker and her colleagues needed a simple way to gauge vasopressin levels in the brain. They analyzed blood and cerebrospinal fluid from 28 people and found that the amount of vasopressin in blood parallels that in cerebrospinal fluid. This suggests that blood levels of vasopressin "could be used as a surrogate for what's going on in the central nervous system," says Elliott Sherr[^], professor of neurology at the University of California, San Francisco, who was not involved in the study.

The researchers then collected blood samples from 159 children, 57 of whom have autism. All of the children completed a battery of psychological tests probing their social functioning. One of the tests measures **theory of mind** — the ability to infer the beliefs, desires and intentions of others.

Children with and without autism showed a range of vasopressin levels. Although no striking

differences emerged between the children who have autism and those who do not, the researchers found that among those with autism, low vasopressin levels track with low scores on the **theory of mind** test.

Sherr calls the early findings provocative but also perplexing, given that other work hints that low vasopressin activity leads to greater social ability. At the **2014 International Meeting for Autism Research**, a different team of researchers reported that a drug that blocks vasopressin receptors in the brain **improves social function in adults** with autism.

“Both groups here are clearly interested in the role that [vasopressin] plays but have very different takes on what side of the coin to be on,” Sherr says.

Parker and her team are testing the effects of **sniffing vasopressin on the social skills** of children with autism. They plan to measure vasopressin in the children’s blood before and after the children sniff the hormone to determine whether blood levels correlate with social behavior.

Parker says low vasopressin could be a biomarker for certain forms of autism. “There are probably many subtypes of autism, and identifying biomarkers of these subtypes would be very important in tailoring treatments.”

REFERENCES:

1. Carson D.S. *et al. PLoS One* **10**, e0132224 (2015) [PubMed](#)
2. Donaldson Z.R. *et al. Behav. Neurosci.* **124**, 159-163 (2010) [PubMed](#)