Researchers look at boy-girl differences in autism

Karen Weintraub, Special for USA TODAY   *2:54 p.m. EST February 27, 2014*

Geneticists think they may have an explanation for why autism is more likely to strike boys.

(Photo: Doug Kapustin for USA TODAY)

It has long been clear that autism strikes boys more often than girls. But when girls do get the condition, they tend to be at the severely affected end of the spectrum.

Now, a group of geneticists thinks they've figured out why.

Boys, it seems, can develop autism from a relatively small genetic hit, according to a study published today in the *American Journal of Human Genetics*. It takes more of a genetic wallop, though, to cause autism in girls – so when they do get it, they're worse off.

The same explanation holds true, researchers think, for the gender imbalance in ADHD (attention-deficit hyperactivity disorder), intellectual disabilities and schizophrenia.

"In the male, maybe more subtle things are enough to create a disorder," said geneticist Jean-Louis Mandel of the College de France in Paris and the Academic Hospital in Strasbourg, France, who was not involved in the study.

This finding, in a study of more than 16,000 people, confirms that autism is not simply being missed in females – it is actually occurring less often, said Kevin Mitchell, a geneticist at Trinity College in Dublin.

There are about seven males with mild autism for every female, though the gender gap is much smaller at the more severe end of the spectrum.

The study also showed that the mutations behind the autism are either new ones that develop in the child, or come from the parents – most likely from the mother.

A man who is severely affected by an autism-related genetic glitch is more likely to have trouble forming relationships and therefore less likely to have children, Mitchell said, so less likely to pass the mutation on. A woman, who can have the glitch without noticing it, would be more likely to reproduce and therefore pass on the mutation, he said.

The study's lead researcher, geneticist Evan Eichler of the University of Washington, said this is one more piece of the genetic puzzle of autism – which will eventually lead to new diagnoses and treatments.

About 500 genes have been connected to autism – "There's lots of different ways to create an autistic child," he said. But those genes mostly fit into about a dozen different pathways, suggesting different treatment approaches may be most effective for each subtype.

"It's going to be really important to know which pathway your child is in," he said. "I would put money on it that not all drugs and not all behavioral treatments will work the same depending on the basis for how that child developed autism."

Genetics can also help families with autism who are deciding whether to have another child. If the child has a rare mutation that isn't present in the parents, their next child is probably no more likely to have autism than any other family, Mitchell said. If the mother has a risky mutation, however, the odds of having a second child on the autism spectrum will be much higher.

The study was quite large and well done, Mitchell and Mandel said. But not everyone is convinced that genes tell the whole story. It's possible that the hormones a fetus is bathed in during pregnancy also play a role in the vulnerability of males, said Irva Hertz-Picciotto, an epidemiologist at the University of California, Davis, and director of the school's MIND Institute Program in Environmental Epidemiology of Autism and Neurodevelopment.

"Boys are swimming in measurably more testosterone than girls are," she said. "Some evidence suggests that social behaviors are in part determined by such early life exposures to sex steroids."