

## Preeclampsia during mother's pregnancy associated with greater autism risk

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Quinn, an autistic boy, and the line of toys he made before falling asleep. Repeatedly stacking or lining up objects is a behavior commonly associated with autism. Credit: Wikipedia.

Children with autism spectrum disorder (ASD) were more than twice as likely to have been exposed in utero to preeclampsia, and the likelihood of an autism diagnosis was even greater if the mother experienced more severe disease, a large study by researchers with the UC Davis MIND

Institute has found.

Women with [preeclampsia](#) experience hypertension during the latter half of their pregnancies, and may have increased levels of protein in their urine and edema, or fluid retention. Preeclampsia can develop into eclampsia, a life-threatening condition in which seizures may occur.

The study was conducted in more than 1,000 [children](#) between the ages of two and three years enrolled in the Childhood Risks of Autism from Genetics and the Environment (CHARGE) Study in Northern California. It is published online today in *JAMA Pediatrics*.

"We found significant associations between preeclampsia and ASD that increased with severity. We also observed a significant association between severe preeclampsia and [developmental delay](#)," said Cheryl Walker, study senior author, assistant professor, Department of Obstetrics and Gynecology Division of Maternal Fetal Medicine and a researcher affiliated with the UC Davis MIND Institute.

While preeclampsia has previously been examined as a risk factor for [autism](#), the literature has been inconsistent. The current study provides a robust population-based, case-controlled examination of the association between autism and preeclampsia and whether risk was associated with preeclampsia severity.

The research was conducted in more than 500 male and female children diagnosed with autism; nearly 200 diagnosed with developmental delay; and 350 children who were developing typically. All of the mothers had confirmed diagnoses of preeclampsia.

It found that the mothers of children with autism were more than twice as likely to have had pregnancies complicated by preeclampsia. Mothers of children with autism and children with developmental delay also were

significantly more likely to have had placental insufficiency, severe preeclampsia or both, when compared to the mothers of children who were developing typically. The children with autism of mothers with preeclampsia also were more likely to be cognitively lower functioning.

The large, population-based study also found a correlation between preeclampsia and developmental delay without autism, primarily in instances involving placental insufficiency.

There are several mechanisms by which preeclampsia may affect the developing brain, Walker said.

For the fetus, limitations in nutrient and oxygen availability cause progressive oxidative stress which prompt the release of proteins into the maternal bloodstream in an effort to improve circulation.

"The level of detail obtained by the CHARGE Study on predictors, confounders, and outcomes enabled a comprehensive exploration of this topic," Walker said. "While single studies cannot establish causality, the cumulative evidence supports efforts to reduce preeclampsia and diminish severity, to improve neonatal outcomes."

Provided by UC Davis

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