
Prenatal Vitamins, One-carbon Metabolism Gene Variants, and Risk for Autism.


Source
From the aDepartment of Public Health Sciences, University of California Davis School of Medicine, Davis, CA; bMedical Investigation of Neurodevelopmental Disorders (M.I.N.D.) Institute, University of California Davis, Sacramento, CA; cDepartment of Pediatrics, University of California Davis School of Medicine, Davis, CA; dDepartment of Preventive Medicine, Institute for Genetic Medicine, University of Southern California Keck School of Medicine, Los Angeles, CA; eDepartment of Biochemistry and Molecular Medicine, University of California Davis School of Medicine, Davis, CA; and fCenter for Healthcare Policy and Research, University of California Davis School of Medicine, Davis, CA.

Abstract

BACKGROUND:
Causes of autism are unknown. Associations with maternal nutritional factors and their interactions with gene variants have not been reported.

METHODS:
Northern California families were enrolled from 2003 to 2009 in the CHARGE (CHildhood Autism Risks from Genetics and Environment) population-based case-control study. Children aged 24-60 months were evaluated and confirmed to have autism (n = 288), autism spectrum disorder (n = 141), or typical development (n = 278) at the University of California-Davis Medical Investigation of Neurodevelopmental Disorders Institute using standardized clinical assessments. We calculated adjusted odds ratios (ORs) for associations between autism and retrospectively collected data on maternal vitamin intake before and during pregnancy. We explored interaction effects with functional genetic variants involved in one-carbon metabolism (MTHFR, COMT, MTRR, BHMT, FOLR2, CBS, and TCN2) as carried by the mother or child.

RESULTS:
Mothers of children with autism were less likely than those of typically developing children to report having taken prenatal vitamins during the 3 months before pregnancy or the first month of pregnancy (OR = 0.62 [95% confidence interval = 0.42-0.93]). Significant interaction effects were observed for maternal MTHFR 677 TT, CBS rs234715 GT + TT, and child COMT 472 AA genotypes, with greater risk for autism when mothers did not report taking prenatal vitamins periconceptionally (4.5 [1.4-14.6]; 2.6 [1.2-5.4]; and 7.2 [2.3-22.4], respectively).
Greater risk was also observed for children whose mothers had other one-carbon metabolism pathway gene variants and reported no prenatal vitamin intake.

**CONCLUSIONS:**
Periconceptional use of **prenatal vitamins** may reduce the risk of having children with **autism**, especially for genetically susceptible mothers and children. Replication and mechanistic investigations are warranted.

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