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

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Source

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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:

Periconceptual 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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