

Higher maternal choline attenuates effects of gestational infection on childhood behavior

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Abstract

Background and Objectives: Common infections during early pregnancy are associated with increased incidence of later mental illness in the offspring, including schizophrenia in adulthood. Animal models demonstrate that increased maternal choline decreases consequences of maternal immune activation on fetal brain development and improves subsequent behavior. The study's objective was to determine in pregnant women whether higher maternal choline levels attenuate effects of maternal infection on fetal development of cerebral inhibition assessed in the newborns at 1 month of age and on behavior at 1 year of age.

Methods: Periodic prenatal assessments of maternal infection, mood, inflammatory markers, and choline levels and postnatal assessments of the infant's neurophysiology and behavior were conducted in 162 women and their children.

Results: Maternal infection raised levels of maternal inflammatory markers. Higher choline levels in mothers who reported infections at 16 weeks were associated with increased cerebral inhibition in their newborns at 1 month of age. At 1 year of age, infants whose mothers reported infection but also had higher choline levels during pregnancy had better development of self-regulatory behaviors including the ability to enjoy and concentrate in quiet play.

Conclusions: Problems in early brain function and their behavioral consequences are developmentally associated with later mental illness. Higher maternal choline levels may lessen adverse effects of common infections during gestation on fetal brain development and improve early behavior. Maternal infections are a common risk in pregnancy, but choline levels are readily increased by widely available supplements, as now recommended by the American Medical Association.