High circulating folate and vitamin B-12 concentrations in women during pregnancy are associated with increased prevalence of atopic dermatitis in their offspring.


Generation R Study Group.

OBJECTIVE: Recent studies suggest that in utero exposure of methyl donors influences programming of the fetal immune system in favor of development of allergic disease. The aim of this study was to assess whether the MTHFR C677T polymorphism, folic acid supplementation, and circulating folate and vitamin B-12 concentrations during pregnancy were associated with wheezing, shortness of breath, and atopic dermatitis in offspring.

METHODS: The study was a population-based birth cohort from fetal life until 48 mo (n = 8742). The use of folic acid supplementation during pregnancy was assessed by questionnaire. Plasma folate and serum vitamin B-12 concentrations and the MTHFR C677T polymorphism were available from blood collected in early pregnancy. Atopic dermatitis, wheezing, and shortness of breath in the offspring were assessed by parental-derived questionnaires at 12, 24, 36, and 48 mo.

RESULTS: Maternal folate >16.2 nmol/L and vitamin B-12 >178 pmol/L were positively associated with the development of atopic dermatitis [adjusted OR: 1.18 (95%CI: 1.05-1.33) and adjusted OR: 1.30 (95%CI: 1.06-1.60) for the highest quartiles of folate and vitamin B-12 concentrations, respectively] but not with wheezing and shortness of breath. Maternal MTHFR C677T polymorphism and folic acid supplementation were not associated with wheezing, shortness of breath, and atopic dermatitis. No interactions were found by age, family history of atopy, folic acid supplementation, MTHFR C677T polymorphism, or maternal smoking (P-interaction > 0.10).

CONCLUSION: High folate and vitamin B-12 levels during pregnancy are associated with increased prevalence of atopic dermatitis in the offspring. Potential risks of high folate and vitamin B-12 concentrations on allergic outcomes should be evaluated when discussing mandatory fortification programs.

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