

ORIGINAL RESEARCH COMMUNICATION

## Maternal smoking is associated with decreased 5-methyltetrahydrofolate in cord plasma<sup>1,2,3</sup>

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**Background:** Maternal-fetal folate transport via the placenta has been shown to be concentrative. Exposure to cigarette smoke is associated with decreased maternal folate status through altered dietary intakes and possibly through nondietary mechanisms such as increased folate turnover. The effect of maternal smoking on fetal folate status has not been documented.

**Objective:** The objective was to determine the effect of maternal smoking on plasma 5-methyltetrahydrofolic acid (5-MTHFA) concentrations in umbilical cord blood.

**Design:** African American women were recruited from an antenatal clinic in Detroit, MI. Plasma 5-MTHFA concentrations were measured in maternal-umbilical cord pairings ( $n = 58$ ). The participants completed a structured interview to determine demographic characteristics, including smoking.

**Results:** Concentrations of 5-MTHFA were significantly higher in venous cord plasma ( $16.8 \pm 7.5$  ng/mL) than in maternal plasma ( $13.0 \pm 7.5$  ng/mL) but remained associated ( $r = 0.60$ ,  $P < 0.001$ ) with each other. Cigarettes smoked by the mothers was negatively associated ( $r = -0.31$ ,  $P = 0.019$ ) with venous cord 5-MTHFA concentrations and remained so after control for maternal plasma 5-MTHFA and other variables. Venous cord plasma 5-MTHFA was significantly lower in smoking ( $15.1 \pm 7.6$  ng/mL;  $n = 32$ ) than in nonsmoking ( $19.0 \pm 7.0$  ng/mL;  $n = 26$ ) mothers.

**Conclusions:** Cord plasma 5-MTHFA concentrations were elevated relative to maternal blood, as expected, because the placenta is capable of concentrative folate transport to the fetus. The negative effect of maternal smoking on infant, but not on maternal, 5-MTHFA status indicates that maternal smoking may impair folate transport to the fetus.

**Key Words:** 5-Methyltetrahydrofolic acid • folate • folic acid • African American women • pregnancy • smoking • electrospray mass spectrometry • infants • umbilical cord • placenta

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