Abstract

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Concentrations of tocopherols and carotenoids in maternal and cord blood plasma.

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OBJECTIVES: To determine the levels of tocopherols, retinol and carotenoids in maternal and umbilical cord blood plasma and to investigate the relationships between them.

DESIGN: Venous blood plasma concentrations of alpha, gamma and delta-tocopherol, retinol, lutein, lycopene, zeaxanthin, beta-cryptoxanthin, alpha and beta-carotene were determined by HPLC in healthy pregnant women and in pair-matched umbilical cords. Plasma levels of triglycerides and cholesterol were also measured.

SUBJECTS: Sixty-six women, between 10 and 20 weeks gestation, were recruited randomly during their first antenatal appointment. From this group, 40 pair-matched umbilical cord blood samples were obtained.

RESULTS: Tocopherols, retinol, carotenoids and lipids were present in significantly higher ($P < 0.001$) concentrations in maternal plasma than in cord plasma. There was a significant correlation ($r = 0.45$, $P < 0.005$) between maternal and cord levels of gamma-tocopherol, but not of alpha-tocopherol, retinol or carotenoids. Tocopherols and carotenoids were significantly correlated with each other ($P < 0.05$) in maternal and cord plasma.

CONCLUSIONS: Plasma levels of tocopherols, carotenoids and lipids are substantially lower at birth than in adulthood. There is a clear relationship between gamma-tocopherol levels in maternal and cord plasma. The importance of gamma-tocopherol in human nutrition should be further investigated. There are no significant relationships between plasma alpha-tocopherol and carotenoids in pregnant mothers and cords. More research is needed to elucidate the maternal-foetal transfer of tocopherols and carotenoids, and to examine the impact of maternal antioxidant nutrient status on neonatal antioxidant capacity. It is important to determine if a low level of tocopherols and carotenoids at birth is a normal stage of human development or indicative of deficiency.

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