Vitamin C Supplementation Increases Low Plasma Vitamin C Levels of Premature Infants Fed Human Milk

K. Heinonen, I. Mononen, and T. Mononen

Children's Hospital and Department of Clinical Chemistry, University of Kuopio, Kuopio, Finland

To evaluate the vitamin C nutritional status of premature infants, vitamin C concentrations were measured in seven neonates born before 32 weeks gestation and in 13 premature infants born at or after 32 weeks. Samples of umbilical venous plasma from 14 full-term infants were analyzed to provide reference values. Vitamin C was assayed by the modified method of Rose and Nahrwold (1) on an amino acid column connected to an ultraviolet-visible detector set to a wavelength of 254 nm (2). There was a very good correlation \( r = 0.9335; n = 26 \) between results obtained using the high-performance liquid chromatography (HPLC) method and the commonly used microfluorometric method.

Oral feedings with pooled pasteurized milk from human donors were initiated 1 to 3 days after birth, and intake was gradually increased to 200 ml/kg/day during the second week. After 2 weeks, the 13 larger infants received approximately half their daily intake from their own mothers. In umbilical venous plasma, vitamin C levels of preterm infants were similar to those observed in full-term infants. During the first week of life, however, plasma concentrations of vitamin C in preterm infants fell rapidly, and very low levels were observed at the end of the first week of life and thereafter (3). The clinical importance of these findings, the requirements of vitamin C supplementation, and means for providing such supplementation should now be explored in detail. The preliminary evidence suggests that peroral vitamin C supplementation (8 mg/day), starting at the second week of life, increases the low-plasma vitamin C levels at least above 6 mg/liter. Such plasma vitamin C levels are generally considered to indicate adequate vitamin C intake.
REFERENCES