



28 Days



What Parents Need to Know About Vitamin K Administration at Birth

SANDRA BELLINI

Among advances in preventive care for children, the prophylactic treatment of vitamin K deficiency-associated hemorrhagic disease in the newborn period has been an important one. Regardless, as times and society change, some practices require reexamination for relevance and necessity. This is especially true when particular practices have been in place for decades and new research evidence emerges. For these reasons, a close examination of the prophylactic use of vitamin K in the newborn period is warranted.

Brief Review of Vitamin K Physiology in Newborns

There are several types of vitamin K, with the most important in humans referred to as vitamin K1 and K2 (Blackburn, 2007; Lippi & Franchini, 2011). These vitamins, especially vitamin K1, play an important role in converting precursor proteins synthesized by the liver into anticoagulant proteins (Blackburn, 2007); hence, the critical role of vitamin K in the coagulation process. In adults, dietary intake of green leafy vegetables, some vegetable oils and

Abstract Prophylactic treatment of newborns with intramuscular vitamin K has been the standard of care for many years in the United States. However, instances of parental refusal of routine prophylaxis are currently on the rise. Refusal of routine prophylaxis can have serious long-term neurodevelopmental consequences for some newborns, who may subsequently develop vitamin K deficiency-associated hemorrhagic disease of the newborn (HDN). DOI: 10.1111/j.1751-486X.12208

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some fruits provides adequate sources of vitamin K1 (Lippi & Franchini, 2011). Bacteria contained in human intestine plays a significant role in the endogenous synthesis of vitamin K2 (Lippi & Franchini, 2011).

During fetal development, placental transfer of vitamin K is low, leading to an exogenous deficiency of vitamin K in newborns secondary to low substrate intake. This results in a deficiency at birth of vitamin K dependent clotting factors, specifically factors II, VII, IX and X, and a corresponding physiologic hypoprothrombinemia (Blackburn, 2007). Newborns' main dietary intake of vitamin K is either through breast milk or through commercially available infant formula; breast milk contains significant-

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ly lower levels of vitamin K than does commercial formula (Lippi & Franchini, 2011). Therefore, insufficient dietary intake of vitamin K continues after birth, especially in exclusively

breastfeeding infants. Recommended prophylaxis of vitamin K by injection in the newborn period replaces physiologically low vitamin K1 levels and decreases the risk of vitamin K deficiency associated hemorrhage.

Deficiency of vitamin K2 also continues after birth, secondary to the inherent sterility of the newborn gastrointestinal track, which doesn't contain sufficient bacteria for the synthesis of endogenous vitamin K. Interestingly, the bacterial colonization process that begins with the introduction of feedings during the first few days of life, and which determines the type and functions of intestinal bacteria, has been shown to be distinctly different when comparing infants who are receiving breast milk to those who are feeding commercial formulas (Blackburn, 2007) and continues to influence endogenous vitamin K levels.

Current Recommendations

The American Academy of Pediatrics (AAP) recommendations for vitamin K deficiency associated bleeding and hemorrhagic disease of the newborn (HDN) prophylaxis remain 0.5 to 1 mg intramuscular injections shortly after birth (Luchtman-Jones & Wilson, 2010), which is consistent with standard practice set by the



Sandra Bellini, DNP, APRN, NNP-BC, CNE, is an associate clinical professor and director of the DNP and NNP Programs at the University of Connecticut School of Nursing in Storrs, CT. The author reports no conflicts of interest or relevant financial relationships. Address correspondence to: sandra.bellini@uconn.edu.

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