Abstract: Current medical practice is to administer vitamin K to all newborns at birth to prevent vitamin K deficiency bleeding (VKDB). Unlike medicalized birth, it is argued that physiological birth works in combination with the innate newborn clotting system. Mechanisms at play in physiological birth are discussed and the administration of vitamin K in physiological birth is questioned.

The Effects of Medicalized Birth Practices on Clotting Mechanisms

Immediate cord clamping limits the initial amount of clotting factors the newborn receives. In addition, a number of common practices deplete the clotting factors the newborn does receive. Trauma caused by a difficult birth (forceps, vacuum extraction, bruising), limited early breastfeeding (thereby limiting oral vitamin K intake from high fat colostrum) and early infant circumcision all fall into this category (Falcao 1997). These features of medicalized birth are unusual to practitioners utilizing a physiological management of birth. In fact, when supported through a physiological transition to life, the newborn clotting system seems ideally designed for the complexities present during the first week of life.

A Hypothesis for Clotting Mechanisms in Physiological Birth

Delayed cord clamping is employed in physiological birth, with varying lengths of time. Some practitioners consider delayed clamping to be three minutes after birth, others clamp five minutes after birth and many wait to clamp the umbilical cord until after pulsing ceases. The effect on the newborn blood supply is dramatic. Not only does the baby receive up to 50% more blood than in immediate cord clamping and a greater amount of clotting factors, but blood viscosity also increases 40% in the first two hours after birth, an increase not seen in immediate cord clamping (Gunther 1957; Linderkamp et al. 2002). As explained by Hathcock (2006), as blood viscosity increases, the flow of blood through the veins can be reduced, leading to red blood cell aggregation. Red blood cell concentration is listed as an influencing factor for aggregation, and higher levels of fibrinogen enhance the process.

When breastfeeding is initiated, the newborn initially receives only small amounts of colostrum. This reduced intake volume leads to slight physiological dehydration in the newborn, increasing blood viscosity even further for the newborn’s first three to five days of life. While receiving this colostrum, the newborn also receives a small supplement of vitamin K (Canfield et al. 1991). The mother’s milk comes in, dehydration slowly resolves while bacteria colonize the newborn’s gut. Over the first week of life, the increase in vitamin K corresponds to the increase in the newborn’s clotting factors. Depending on the mother’s diet and supplements, a varying complement of vitamin K is contained in the mother’s milk fat as well (Greer et al. 1997; Bolisetty 1998; Motohara et al. 1990). During this same period, the newborn learns to thermoregulate. Heat loss through the classic four methods (evaporation, radiation, convection and conduction) can drop a newborn’s temperature rapidly.

Although little research has explored increased blood viscosity and its effects on the newborn, research has been done in adults. In one study, while being in normal room-temperature moving air, older adults experienced mild surface (skin) cooling that reduced core body temperature only 0.7°F while increasing the fraction of blood plasma containing platelets 15% and increasing blood viscosity. This rise in platelets was not immediate; most of it occurred after the first hour of cooling.

The authors postulate that “increases in platelets, red cells and viscosity associated with normal thermoregulatory adjustments to mild surface cooling provide a probable explanation for rapid increases in coronary and cerebral thrombosis in cold weather” (Keating et al. 1984). If adults experience thrombosis due to increased platelets and blood viscosity, which results from slightly lower body temperatures, wouldn’t a physiologically born neonate also be at risk for thrombosis if he had a full quota of clotting factors, since he already possesses increased blood viscosity and platelets and is learning to thermoregulate?

In clotting, vitamin K is required to activate prothrombin, leading to the blood’s ability to form fibrin and use platelets to form clots. Without the necessary vitamin K and fibrin, clots would be unable to form, no matter how many platelets were available in the blood. The amount of clotting factors in the newborn allows her body to deal with a slight injury from birth but prevents an embolus from forming in her thick blood, averting thrombosis. By the time a breastfeeding newborn’s blood viscosity returns to normal, levels of vitamin K would be increased, both innately and through his mother’s milk.

Timing is everything. The neonate clotting system seems to be ideally designed for newborns’ specific needs. More research must be done on the
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carries a child between her legs. I follow, draping a towel around her shoulders. We parade down the hall as I herd the great Hathor herself. Our destination is the kitchen, where the birth pool is prepared.

Entrance into the tub proves difficult for this mother. Her baby is low, the edge of the pool high. She clears the hurdle and settles into a warm abyss. Gravity is postponed and allows for a brief respite. A long moan is released and the whole room settles its attention on this mother. Her lament becomes deeper as labor penetrates another plane. She melts into this. Our destination is the room settles its attention on this mother. Hathor herself. Our destination is the kitchen, where the birth pool is prepared. We reassured her that she was fine and her baby rushed out. Then, from water here, one soul becomes two. "I did it!" she says. And surely she has—a VBAC in the kitchen.

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cares her baby and sobbed loud and long. We reassured her that she was fine and she said, "These are tears of joy! I never believed I would actually feel this."

Elizabeth Alemann, ND, is board certified in both Family Medicine and Medical Acupuncture. She has had the great honor to attended births with obstetricians, family physicians, nurses, certified nurse-midwives, certified professional midwives and midwives with no formal credentials in homes, birth centers and hospitals. Now retired from direct maternity care, Elizabeth focuses her professional energies on providing primary care to families in her private practice, writing and advocacy. Vitamin K Continued from page 28

effects of vitamin K injections for newborns that experience physiological birth. In cases of trauma and other special circumstances, there may be justification for an immediate dose of vitamin K in the neonate. In a gentle, physiological birth, nature probably got it right.

Marla Cranford is a master’s candidate and student midwife at Midwives College of Utah. In her down time, she enjoys simmering a pot of collard greens (high in vitamin K), her favorite vegetable. She is married and has seven children.

References:

www.midwiferytoday.com