Vitamin K Prophylaxis

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Acknowledgements

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Preamble

Guidelines outline recommendations, informed by both the best available evidence and by Midwifery philosophy, to guide Midwives in specific practice situations and to support their process of informed decision-making with clients. The Midwifery philosophy recognises the client as the primary decision maker in all aspects of her care and respects the autonomy of the client (1).

The best evidence is helpful in assisting thoughtful management decisions and may be balanced by experiential knowledge and clinical judgment. It is not intended to demand unquestioning adherence to its doctrine as even the best evidence may be vulnerable to critique and interpretation.

The purpose of practice guidelines is to enhance clinical assessment and decision-making in a way that supports practitioners to offer a high standard of care. This is supported within a model of well-informed, shared decision-making with clients in order to achieve optimal clinical outcomes.

Vitamin K Deficiency Bleeding

Vitamin K is a fat soluble vitamin of which there are two types. Phylloquinone (Vitamin K1) is found in some green plants. Menaquinone (Vitamin K2) is synthesised by bacteria in the human gut. This second type of Vitamin K accounts for 90% of the Vitamin K found in the liver which is necessary for the synthesis of prothrombin and clotting factors II, VII, IX, and X. A deficiency in Vitamin K leads to increased coagulation time and potentially spontaneous bleeding (2). Long term it can affect the ability of the body to regulate calcium and bone development (3, 4).

Haemorrhagic disease of the newborn (HDN) or, according to the Committee of the International Society on Thrombosis and Haemostasis, Vitamin K Deficiency Bleeding (VKDB) is thought to occur due to a lack of Menaquinone producing bacteria in the intestinal tracts of babies (2).

There are two types of Vitamin K deficiency bleeding: Early and Late. Each varies in its time of onset and affected site (5). The American Academy of Paediatrics notes that 'early onset' VKDB is any unexpected bleeding in the first 2 weeks of life whereas 'late onset' is any unexpected bleeding occurring after the second week and up to 3 to 6 months of age (6).

Early VKDB: Onset occurs in the first 2 weeks of life and is usually the result of a predisposing factor such as preterm newborn, intracranial haemorrhage, trauma at birth or infection. The following sites are affected: cephalhaematoma, umbilicus, intracranial, intra-abdominal, intrathoracic, gastrointestinal, needle prick and circumcision sites (6).

Late VKDB: Onset occurs between 2 weeks and 6 months of age. The cause at this time appears to be idiopathic. The affected sites are intracranial, skin, nose, gastrointestinal tract, needle-prick sites, umbilicus, urogenital tract, and intrathoracic (5).

VKDB can lead to spontaneous bleeding beneath the skin, from the nose, stomach, intestines, wounds or intracranial bleeding. This bleeding can lead to permanent brain damage or death. The morbidity correlates with the severity of the Vitamin K deficiency.

Incidence

The incidence of early VKDB is thought to be between 250 and 1700 per 100,000 live births.

Late VKDB has an incidence of between 4.4 and 7.2 per 100,000 births (6).

Risk factors

- Maternal drug use in pregnancy (anticonvulsants, anticoagulants, tuberculostatics, and cephalosporins)
- Presence of some maternal medical conditions such as short gut syndrome or other malabsorption disorders
- Breastfeeding: There is marginal Vitamin K in breast milk (breast fed babies are more likely to develop late onset VKDB than formula fed but this is not to be taken as an endorsement for formula)
- Inadequate nutrition or poor feeding in the newborn
- Late onset of newborn feeding (colostrum has higher concentrations of Vitamin K than breast milk)
- Malabsorption of Vitamin K in the newborn (liver or bowel disease)
- Increased incidence in males and in summer months (5, 7).

Clinical signs and symptoms

- Failure to thrive
- Prolonged jaundice (both more likely in cases of late onset VKDB)
- Prolonged or excessive bleeding at puncture sites, umbilicus, cephalhaematoma, nose, gastrointestinal tract, and circumcision (5).
- Apnea from intracranial hemorrhage (7).

Diagnosis

The initial workup includes a prothrombin time (PT), activated partial thromboplastin time (aPTT), fibrinogen levels, and a platelet count. The diagnosis is confirmed if the administration of Vitamin K stops the bleeding and reduces the PT value (8).

Prevention

A Vitamin K supplement is recommended as prophylaxis for VKDB and has been administered routinely since the 1950s in North America (6).

Routes of Administration

There are two routes of Vitamin K administration: intramuscular (IM) and oral. Currently, intramuscular is the recommended route (3, 6, 9). Both routes have been shown to improve indices of coagulation status in newborns (9). Therefore, both routes have been shown to lower rates of early and late VKDB, however rates of late VKDB were higher in newborns who received oral doses (6).

Intramuscular

This route is recommended for its high efficacy rate against all forms of VKDB and high compliance rate. It is given as a single dose of 1.0 mg (>1500g) or 0.5 mg (<1500g) (3).

Oral

This may be an alternative for parents who decline the IM administration. Because the body absorbs Vitamin K1 via the small intestine (10), the oral route of administration may more accurately reflect this natural absorption method. In this case, Perinatal Services BC recommends administering Vitamin K in 3 doses of 2mg each: at the first feed, at 2-4 weeks, and at 6-8 weeks (3). Parents should be advised of the importance of the baby receiving follow-up doses and be cautioned that their infants remain at an increased risk of late VKDB (including the potential for intracranial hemorrhage) using this regimen (3, 6).

Some disadvantages of Vitamin K Prophylaxis

- Oral administration poses some challenges in that babies may regurgitate some of the medication, compliance over several weeks is required, there is no oral form licensed in Canada, and the cumulative amount of oral Vitamin k administered is six times the IM dose (8).

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