10 CARE OF THE NEONATE

10.4 Medication Administration to the Neonate

10.4.2 Vitamin K₁ Administration

AIM

To provide administration of prophylactic Vitamin K₁ to prevent Vitamin K₁ deficiency bleeding in the newborn (VKDB).

BACKGROUND INFORMATION

Vitamin K prophylaxis given at birth has been shown to prevent VKDB.¹ The decline of vitamin K levels after birth lead to increased risk of VKDB for the neonate. The colonisation of the intestine by bacteria required to synthesis vitamin K does not occur until milk feeding is established.² Blood clotting factors 11, V11, 1X and X require vitamin K to convert into active clotting factors, and because Vitamin K is poorly transferred across the placenta any stores are quickly depleted after birth.³ Human breast milk contains relatively low concentrations of vitamin K, therefore exclusively breast fed neonates are at increased risk for VKDB. Infant formula is supplemented by law with additional vitamin K.⁴

VKDB is classified according to the age of presentation⁵:

Early VKDB
Occurs within 24 hours and confined to neonates whose mothers have received medications that interfere with vitamin K metabolism.⁵ These include anticonvulsants phenytoin, barbiturates or carbamazepam, the antitubercular medications rifampicin or isoniazid, and vitamin K antagonists such as warfarin and phenprocoumarin.⁴

Classical VKDB
Occurs from one to seven days after birth and is more common in neonates who are unwell at birth or who have delayed onset of feeding.⁴

Late VKDB
Occurs from 8 days to 6 months after birth and is almost always associated with fully breastfed infants. Approximately half of these infants have underlying liver disease or malabsorption problems.⁵

In 1990 a study described an association between intramuscular administration of Vitamin K and childhood cancer and leukaemia. This led to Australia introducing oral doses of Vitamin K which resulted in late cases of VKDB appearing. However, later studies have failed to confirm association with childhood cancer.⁶ No randomised studies have been conducted about this.⁹ The use of IM Vitamin K is again common practice in Australia and its use does not rely on parental compliance to ensure the oral administration regime is followed.⁵

The rate of VKDB in infants without prophylaxis treatment of vitamin K has been reported as between five and 20 per 100,000 births, with a mortality rate of about 30%.⁴
KEY POINTS

1. A single injection of Vitamin K can prevent haemorrhage disease of the newborn.¹

2. A single dose of Vitamin K soon after birth provides higher plasma levels of vitamin K in the first few weeks of life when risk of VKDB is highest, compared to oral vitamin K. Multiple doses of oral vitamin K results in higher plasma levels at two weeks and two months compared to a single dose.¹

3. Written consent on the ‘MR216 Information & Consent for Newborn Care (Vitamin K, Hepatitis B, Newborn Screen Test)’ must be obtained prior to administering Vitamin K to neonates.

4. All neonates should be given vitamin K prophylaxis following maternal consent within 24 hours of birth.⁴

5. The preferred route of administration is by intramuscular injection (IM). Alternatively, if this route is declined, oral administration of vitamin K should be offered.

6. IM administration of vitamin K requires no additional dosages. The advantage of oral administration is that it is non-invasive, and if 100 per cent compliance is achieved it is almost as effective as IM administration.⁴

7. Exclusively breastfed neonates and neonates with malabsorption problems or liver damage are at increased risk for VKDB unless supplemented with vitamin K.⁴

8. Antenatal women who are prescribed medication known to interfere with vitamin K absorption should be offered 20mg of vitamin K daily for at least 2 weeks prior to birth. Neonates born to these mothers should be offered vitamin K within 4 – 6 hours after birth.⁴

9. All antenatal women should be provided with written information about prophylactic vitamin K, and options of oral or IM administration.⁴

10. Neonates with a birth weight of less than 1500g require a smaller dose of 0.5mg (0.05mL) of IM Vitamin K.⁴

11. Parents should be informed that unexplained bleeding or bruising in infants is uncommon and prompt review by a medical practitioner is recommended.⁴

DOSAGE AND ADMINISTRATION

Prior to administration of Vitamin K ensure written maternal consent is completed on the ‘MR 216 Information & Consent for Newborn Care’ form. A pamphlet is available for parents about vitamin K.

INTRAMUSCULAR ADMINISTRATION
Administer 1 mg (0.1mL) of Konakion® MM intramuscularly at birth.

- At KEMH this injection is generally given on admission to the postnatal ward following transfer from the Labour and Birth Suite. This avoids increased risk for potential medication errors in the Labour and Birth Suite.
- It may be administered in the Labour and Birth Suite if the mother has a prolonged stay or if is being discharged home directly from the Labour and Birth Suite.

ORAL ADMINISTRATION

- Oral administration is given as 3 separate doses.
- If the neonate vomits or regurgitates the oral Paediatric Konakion® MM within one hour of dosage, the oral dose can be repeated. While in KEMH discuss with the paediatrician if the neonate regurgitates, vomits, or has diarrhoea after this time and within 24 hours of the dose. They will determine if a repeat dose is required or intramuscular injection is recommended.
- KEMH pharmacy also produces a leaflet ‘Vitamin K Information for Parents’ which contains instructions for administration of oral doses of Paediatric Konakion® MM. This leaflet (from the MIMS product information) advises parents that if the infant spits out, vomits, or has diarrhoea within 24 hours after being given the dose, then a repeat dose is recommended. However, parents must be informed to seek medical advice if regurgitation, vomiting and diarrhoeas continues to occur. Review may determine that intramuscular injection is recommended in some cases.
Oral Vitamin K Administration Regimen

- **First dose**: given at birth. Give 2mg (0.2mL) of Konakion® MM orally with the first feed.
- **Second dose**: given 72-120 hours after birth (0.2mL) of Konakion® MM orally.
- **Third dose**: give 2mg (0.2mL) of Konakion® MM orally at four weeks. The last dose is not required for neonates who are predominantly formula fed. The third dose should be given no later than four weeks post birth as the effect of the earlier doses diminishes over time.

ARRANGING ORAL VITAMIN K DOSES FOR ADMINISTRATION AFTER DISCHARGE

- The paediatrician orders the oral Vitamin K on the ‘MR811 Neonatal Inpatient Medication Chart’. The chart is then sent to Pharmacy for the medication to be issued prior to discharge.
- The second dose is normally administered by the Visiting Midwife Service (VMS). Alternative arrangements may be made prior to discharge for women who are not remaining within the VMS visiting area when the second dose is due.
- Instruct the mother on the regime for follow-up doses of oral Vitamin K. Provide her with the KEMH card for ‘Oral Vitamin K administration for baby’ and the leaflet ‘Vitamin K Information for Parents’. Advise the mother to take the care and dose of oral Vitamin K to the GP for administration of the third dose.

DOCUMENTATION

2. Administration of oral Vitamin K should be documented:
   - First dose on the ‘MR410 Neonatal History’ form.
   - Subsequent doses:
     - Document on the KEMH ‘oral administration vitamin K for baby’ card supplied for the mother.
     - If given as an inpatient at KEMH the subsequent doses are written up by the paediatrician, and documented/signed on the ‘MR811 Neonatal Inpatient Medication Chart’.
     - Document in the Child Health Record

REFERENCES

1. Puckett RM, Offringa M. Prophylactic vitamin K for vitamin K deficiency bleeding in neonates. *Cochrane Database of Systematic Reviews*, 2009(1).

Do not keep printed versions of guidelines as currency of information cannot be guaranteed. Access the current version from the WNHS website