ORIGINS
MIDWIFERY

Vitamin K

Background

Vitamin K is a fat-soluble vitamin that is found in the foods we eat and is manufactured in adults' intestines by the normal bacterial flora. It is also one of the substances involved in blood clotting. At birth, newborns have low levels of both Vitamin K and Vitamin K-dependent coagulation factors. This places them at risk for Hemorrhagic Disease of the Newborn (HDN) or Vitamin K Deficiency Bleeding (VKDB). There is no reliable way to know which babies will have this condition.

Incidence and definition

There are three types of VKDB: early VKDB (within 24 hours postpartum), classic VKDB (occurs on day 1-7) and late VKDB (occurs from week 2-12). Early VKDB can be caused by drugs taken during pregnancy (anticonvulsants, oral anticoagulants, tuberculostatics and cephalosporins). It is prevented by stopping or replacing the offending drugs and giving vitamin K to the mother during pregnancy. Classic VKDB is caused by marginal vitamin K content in breast milk and/or inadequate milk intake for any reason including late onset of feeding. Late VKDB is caused by marginal content of vitamin K in breast milk (of unknown cause) or malabsorption of vitamin K (liver or bowel disease). Both classic and late VKDB can be severe, causing brain damage and death and can be prevented by early and adequate breastfeeding, vitamin K prophylaxis and early investigation of "warning bleeds" such as bleeding from the umbilical site, nose or injection sites. Unfortunately, about one third of cases of VKDB occur without prior warning.

The risk of a baby not given vitamin K developing VKDB (of any type) is 5-25 in 100,000 with a median of 7.1 in 100,000. The incidence of Late VKDB is 4.4-7.2 in 100,000 according to reports from Europe and Asia.

Signs and Symptoms

Clinical signs and symptoms of VKDB (there can also be no outward signs):

- Bleeding from the umbilical cord stump, nose, or gastro-intestinal tract
- Vomiting blood
- Failure to thrive
- Any jaundice after three weeks of age

Risk Factors

- Drugs taken in pregnancy (cephalosporins, anticonvulsants, anticoagulants, tuberculostatics)
- Inadequate breast milk intake

- Late onset of feeding (colostrum has higher concentrations of vitamin K than breastmilk)
- Malabsorption of Vitamin K by neonate (liver or bowel disease)
- Prematurity
- Instrumental delivery
- Surgical procedures such as circumcision

Feeding

Early unrestricted breastfeeding has a protective effect against classic VKDB because colostrum contains higher concentrations of vitamin K than breastmilk and hindmilk contains twice that of foremilk. Formula fed babies are at low risk of developing VKDB due to the addition of vitamin K to formula and the higher levels of vitamin K in cows' milk. This should not be taken as an endorsement of formula use.

Additional information

Studies attempting to link Vitamin K administration and childhood leukemia have been inconclusive and at this time a link cannot be substantiated. The benefits of vitamin K far outweigh the risks, based on current evidence.

Some research has shown improvement in the vitamin K levels in breast milk by giving the mother vitamin K supplements pre and postnatally. Food rich in vitamin K are: dark leafy greens, nettle leaves, alfalfa, cauliflower, lentils, seaweed, broccoli, cabbage and soybeans.

Procedure

Current Alberta Health Services standard practice is to administer 1mg vitamin K intramuscularly (IM) in the baby's thigh with a small needle a few hours after birth. The incidence of VKDB in babies who are given IM vitamin K is 1 in a million. Side effects of the vitamin K injection include the risks associated with any intramuscular injection: infection, irritation of the injection site or nerve and muscle damage as the vitamin K must be injected deep into the muscle. These are extremely rare complications.

There are no oral preparations of vitamin K available in North America. The IM preparation is the only one available to give orally, and its effectiveness remains questionable. The oral regime is 3 doses of 2mg each. There have been no randomized trials for its effect on classic or late VKDB, in either single or multiple doses.

References

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