

Vitamin K?

On this page:

- Introduction
- What is vitamin K and where does it come from?
- Haemorrhagic Disease of the Newborn
- Are some babies more at risk of HDN?
- Where do babies get vitamin K from?
- Oral or intramuscular?
- Homeopathic alternatives
- Conclusion

Introduction

To give vitamin K or not to give it? If it is given, how to give it - by intramuscular injection or as an oral preparation? Does it help if the mother eats more vitamin K- rich foods in the weeks leading up to the birth? Are there satisfactory homeopathic or herbal alternatives that could be used? Do babies need vitamin K anyway?

Since the publication of the Golding studies in 1990 and 1992 which suggested that babies who received intramuscular injections of vitamin K following birth had double the risk of developing childhood leukemia, issues concerning the administration of vitamin K to the newborn have been debated by health professionals and consumers. That three further studies in Sweden, the USA and Denmark did not find a link between intramuscular vitamin K and childhood cancer was reassuring and prompted an editorial writer in the *British Medical Journal* in 1996 to write that it was time to abandon worries about a potential cancer risk from intramuscular vitamin K.

At the time that editorial was written, four studies on vitamin K and cancer were still under way in the UK. These were published, with an accompanying editorial, in the 17 January 1998 issue of the *British Medical Journal*. The results from two of the studies' in that they did not confirm the link between injected vitamin K and leukaemia, were reassuring but the other two did show an increased risk for acute lymphoblastic leukaemia.' The editorial writer expressed disappointment that the four new studies did not resolve the vitamin K-cancer question and hoped that further European epidemiological studies might help answer the question.

What is vitamin K and where does it come from?

Vitamin K is a fat-soluble vitamin which is stored in the liver and it plays a role in the complicated process of blood clotting. Vitamin K is obtained from food sources such as alfalfa (also containing vitamin E which promotes absorption of vitamin K), kelp, all green leafy vegetables, tomatoes, whole grain cereals and milk. Vitamin K is also produced within the body by the bacterial flora in the large intestine and it is thought that about 50% of the vitamin K in the blood of an adult is of bacterial origin. In the newborn however, the gut is sterile and it takes 5 to 7 days for it to become colonised by bacteria.

Haemorrhagic Disease of the Newborn

Babies are born with low levels of vitamin K - this has been referred to as a "deficiency" but more accurately, it is a "relative deficiency" - that is new born babies' levels are low when compared with what is considered a normal level for an adult. Levels fall to day 3 and then begin a gradual rise to day 6. These relatively low levels have been linked to bleeding problems in some new born babies - a condition called Haemorrhagic Disease of the Newborn (HDN).

HDN falls into 3 categories:

1. **Early HDN** occurs in the first 24 hours of life It is rare and is associated with mothers on anticonvulsant therapy.
2. **Classic HDN** occurs between day 2 and 7. The incidence varies from minor haemorrhage in 1 in 400 births to serious haemorrhage occurring in 1 in 10,000 healthy newborn babies. The site of the bleeding varies and may include broken skin sites, navel, nose, gastrointestinal tract and bowel or occasionally, the brain. Bleeding into the brain leads often to death or to brain damage.
3. **Late HDN** occurs after the first week of life and mainly involves bleeding into the brain, although it may also involve bleeding from the gut. The incidence is estimated to be 40-100 per million live births.

Interestingly, it has been recognised from very early times that some newborn babies are prone to excessive bleeding and that is probably why the Jewish religion did not permit circumcision within the first week of life. As circumcision is a significant risk factor in Classic HDN, it is a very good reason why circumcision of the newborn should not be carried out today.

Are some babies more at risk of HDN?

It is debatable as to what determines the extent of a baby's vitamin K store at birth, how long these stores last and whether malabsorption of vitamin K is a major factor in causing

HDN. What is acknowledged is that babies most "at risk" are those where there are factors which reduce a baby's ability to absorb or utilise vitamin K. These include premature or low birthweight babies, babies who have a traumatic delivery, bruised or bleeding babies in the first few days of life, those requiring surgery, those taking inadequate feeds, babies with insufficient liver function, and those being treated with antibiotics. It is also agreed that babies of mothers who have been on anticonvulsant drug therapy or who have been treated with anticoagulants during pregnancy are also at risk of bleeding. Exclusive breastfeeding has also been associated with a higher incidence of HDN.

Where do babies get vitamin K from?

Clearly new born babies do not eat the foods that contain vitamin K. In the initial few days after birth, they obtain their vitamin K from stores in their liver, from vitamin K-fortified formula if babies are formula-fed, and from breastmilk. There is presently no evidence to show that increased consumption of vitamin K-rich foods by the mother preceding the birth has any effect on the foetal liver stores. However, in the days following birth, it is important to note that the concentration of fat-soluble vitamin K is greater in colostrum and hind milk and it has been found that vitamin K levels in breastmilk depend on maternal intake in the last stage of pregnancy.

Unfortunately, it has been common until recently to restrict the baby's time at the breast in the first few days, thus ensuring the baby receives less than optimal amounts of vitamin K-rich colostrum and hind milk. This also prolongs the time it has taken to establish the baby's intestinal bacteria which manufacture vitamin K. For the many who do not believe "nature got it wrong" in allowing a fully breastfed infant to bleed to death, this goes some way to explaining the link between the higher incidence of HDN and breastfeeding. There may well be environmental factors involved but in any event, babies should certainly be breastfed without any restrictions from birth .

Oral or intramuscular?

As Golding's studies showed no association between oral vitamin K and leukaemia, it became widespread practice to give vitamin K by mouth. In New Zealand in the mid 1990's, this was the preferred option for healthy term infants. However, there are problems associated with the oral route. Roche, the manufacturer of the vitamin K injection (Konakion) does not recommend the administration of the injectable solution orally . The dose, which is designed by the manufacturer to be given by injection, may be spat out or vomited, it may be an irritant on the mucus lining of the mouth and throat and there are questions about how well it is absorbed.

There is an oral preparation of vitamin K - the mixed micelle preparation. Although it has

been in use in parts of Northern Europe for some time, it has mainly been used here by some midwives who have specially imported it to give parents more choice. There is an oral formulation of vitamin K and although Roche has now made it available in New Zealand, as yet it is not on the Pharmac schedule. It may be purchased by health care providers through pharmacies.

Oral Konakion MM is given at birth, 4-7 days and at 4-6 weeks, although the last dose may be omitted if the baby is formula-fed. If a breast fed baby does not receive 3 doses of the oral preparation, they may have only partial protection from HDN and there are reported cases of late HDN in infants who have received only 1 or 2 oral doses. A 1996 Danish study suggests that the oral preparation needs to be given weekly during the first three months of life to be as effective as the intramuscular injection in preventing late onset bleeding.

Limited studies have shown this "mixed micelle" solution has greater reliability of absorption in both normal newborns and those born with chronic liver problems. A 1998 study compared oral Konakion MM with the standard injected vitamin K during the first 8 weeks of life in exclusively breast fed infants. The conclusion of the study was that plasma vitamin K concentrations were at least equal or significantly higher in babies given oral vitamin K supplements compared with IM treated babies at the time points measured.

In 1995, the Paediatric Society of New Zealand recommended that all infants should have vitamin K and the recommended route of administration was by intramuscular injection at birth. If parents do not agree to an intramuscular injection, the alternative was for them to have the same preparation orally at birth, at 5 days and at 6 weeks. There is no doubt that the high dose of vitamin K as an injection has been shown to prevent Classical and Late HDN although the existence of other conditions where HDN has occurred has indicated that vitamin K deficiency may not be either the prime or sole factor involved.

Parents of the newborn have a right to information about the UK studies suggest a possible link between intramuscular vitamin K and childhood cancer. The Golding studies, which were termed "worrying but not certain", showed that intramuscular vitamin K gave a 1:500 chance of subsequent childhood cancer. This compared to the risk of severe haemorrhage in HDN of being 1:10,000. The two of the four 1998 British studies which do suggest an increased risk of cancer, report a much smaller size of risk than that suggested by Golding. They almost definitely rule out the risk of tumours but put the size of the increased risk for leukaemia at somewhere up to 10%. It is also important for parents to know that a number of studies did not confirm the link.

Why there may be a link between injected vitamin K and childhood leukaemia has been widely debated. Following an injection of vitamin K, a baby's body may contain up to 5,000

times the normal level of the vitamin. It has been speculated that this may accelerate tumour producing activity and that the relative vitamin K deficiency was designed by nature to protect against the induction of genetic mutation at a time of rapid cell division. There is speculation too that phenol which is included in the injected preparation is a substance which can cause cancer.

Homeopathic alternatives

Because of the elements of uncertainty surrounding both the oral and injected preparations, some parents may wish to learn more about natural alternatives. The recommended homeopathic preparations are Arnica and Aconite, with calc. fluor being useful where cephalhaematoma is present. It is essential however that any parent considering homeopathic alternatives should consult a registered homeopath as there are no specifics in homeopathy and every case needs to be considered individually.

Conclusion

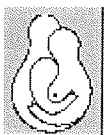
Under the *Code of Rights for Health and Disability Service Consumers*, parents have a right to a clear explanation of the treatment proposed, including any risks and alternatives, before they agree to treatment for their child. In the case of vitamin K, the information is confusing and explains why the 1998 BMJ editorial is entitled "Neonatal vitamin K prophylaxis: the Gordian Knot still awaits untying". Yet more research is necessary to find out the real risks, if any, of a large dose of vitamin K at birth are. Until then, parents will need to read all information available to them and together with a properly informed opinion from their caregiver, then make a decision which best suits them and their baby.

Sharron Cole, PCNZ Childbirth Education Advisor August 2000

This is an updated version of the article "Vitamin K?" which was printed in the *Parents Centre Magazine*, no. 147, June/July 1995

For an extensive list of references used in compiling this article, please contact PCNZ national office, Ph 04 476 6950 or email helen@parentscentre.org.nz

[Home Page](#)



© Copyright 2000 Parents Centres New Zealand Inc.

Email: helen@parentscentre.org.nz

Phone + 64 4 476 6950 Fax +64 4 476 6949 Post PO Box 17 351, Wellington, New Zealand

Call us now on 0900 PARENTS (72736) to make an instant donation of \$10 to the work of Parents Centre. Calls from within New Zealand only are accepted. Your donation will appear on your next telephone statement. Thank you for supporting Parents Centre.