Do mothers understand the reasons for giving vitamin K to their newborn babies?

Late-onset vitamin K deficiency bleeding has serious implications for newborn infants. This service evaluation project assesses current provision of information regarding prophylactic vitamin K and the level of maternal understanding of the reasons for giving it. New mothers were interviewed about their knowledge of vitamin K. Although 97% of mothers had heard of it, only 28% actually understood the purpose of vitamin K prophylaxis. There are a number of sources of information about vitamin K available to expectant mothers but the information sharing process fails to achieve sufficient knowledge to enable informed consent. There is a need to improve information sharing tools during the antenatal or post-labour period.

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Key points

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1. Vitamin K prophylaxis for all newborn babies in the UK is endorsed by the National Institute for Health and Care Excellence.
2. The information sharing systems in place for educating parents regarding vitamin K prophylaxis may not be effective.
3. Realistic assessment of parents' knowledge and understanding is pivotal in achieving compliance.

Vitamin K is required for the production of clotting factors and is involved in the normal clotting of blood. All newborn infants have low levels of vitamin K and are at risk of developing vitamin K deficiency bleeding (VKDB, previously referred to as haemorrhagic disease of the newborn).[1-3]

VKDB can result in intracranial haemorrhage and significant morbidity and mortality, particularly in breastfed babies due to low levels of vitamin K in breast milk. Consequently, in the UK and most other developed countries supplemental vitamin K is offered to all newborn babies.

The National Institute for Health and Care Excellence (NICE) endorses vitamin K prophylaxis as a universal preventative measure to combat late-onset VKDB. The NICE clinical guideline (CG37) recommends that all babies should be given prophylactic vitamin K and that administering a single dose of 1mg intramuscularly is the safest and most cost-effective method.[4] Refusal and anxiety among parents is not uncommon. Parents can decline the injection, in which case oral therapy should be offered as a second-line option, and they may refuse prophylaxis altogether. Exploring the reasoning behind this mind-set and the efficacy of the information sharing process becomes crucial to the success of the prophylaxis programme.[5]

What information is provided to parents?

A primigravid woman has up to 12 essential antenatal appointments compared with eight in a multigravid. There are also a number of optional antenatal parent education classes designed to optimally prepare the parents to care for their newborn infant. Routinely, a vitamin K advice leaflet is provided at the 20-week antenatal appointment. After this point, the mother will be followed up in the community, where vitamin K is only briefly discussed. The final opportunity for discussion of vitamin K with mothers is when they arrive at hospital during labour. At this point parents are asked to consent to vitamin K prophylaxis for their newborn baby.

Aims and methods

This service evaluation project set out to:

- assess information provision regarding vitamin K prophylaxis for newborn babies
- examine the level of maternal understanding of the reasons for giving vitamin K
- understand factors influencing parental decisions regarding prophylaxis
- consider areas for improvement to allow for appropriately informed consent.

Mothers with healthy term babies and no anticipated problems on the postnatal ward at St Mary's Hospital, Manchester,

were invited to participate in the study. The mothers were asked to complete a 10-question survey (**FIGURE 1**) within the first few days of their baby being born, to assess their understanding of:

- the role of vitamin K in prophylaxis of VKDB
- whether their baby received the prophylaxis and, if so, which preparation.

A group of 100 mothers was deemed an achievable target with a reasonable return.

A medical student attended the bedside of the mothers to read through the questionnaire. If partners were present at the bedside and the mother was happy for their involvement, they also participated in answering the questions. Any additional information provided by the mothers/partners during the open-ended questions was noted (eg feelings about the risks of prophylaxis or improvements that could be made when sharing information).

Vitamin K survey

Ward: Age of mum: Number of births: Previous babies receiving vitamin K:
Age of baby:

1. Have you heard of vitamin K?
   Yes ☐ No ☐ Don't know ☐
2. What do you understand about vitamin K?
   It's good for you ☐ Useful in clotting ☐ Helps with blood ☐ Nothing ☐ Other ☐
   .....
   .....
3. How do you know about vitamin K?
   Leaflet ☐ Discussed with you ☐ Don't know ☐ Other ☐
4. When was vitamin K discussed with you?
   20-week antenatal appointment ☐ Labour ☐ Never ☐
5. Were you given a leaflet on vitamin K?
   Yes ☐ No ☐ Don't know ☐
6. If yes, did you read this leaflet?
   Yes ☐ No ☐ Don't remember ☐
   If yes, how did you feel about the risks?
   .....
   .....
7. Has your baby been given vitamin K?
   Yes ☐ No ☐ Don't know ☐
   If you have answered no or don't know, why is that?
   .....
   .....
8. Did you have to sign consent for your baby to be given vitamin K?
   Yes ☐ No ☐ Don't know ☐
9. What preparation of vitamin K was your baby given?
   Injection ☐ Oral ☐ Don't know ☐
10. Do you feel you had enough information to make a decision?
    Yes ☐ No ☐ Don't know ☐
    If no, what could be done to improve this?
    .....
    .....

FIGURE 1 The questionnaire to assess mothers' understanding of vitamin K prophylaxis.

Results

The mean age of mothers participating in the survey was 30.4 years (standard deviation ±6.0) and 56% were multigravida. Of the 100 mothers surveyed:

- 93% opted for the recommended preparation of intramuscular vitamin K
- 1% received the oral preparation due to a possibility of Von Willebrand disease
- 1% opted out of the vitamin K programme
- 5% did not know whether their baby had received any form of prophylaxis.

Interestingly, according to their hospital records, an information leaflet was given to all mothers at the 20-week antenatal appointment; however, only 54% of mothers said they had received it. Of those that remember receiving the leaflet, 61% read it and 19% admitted to not having read it.

Although 97% of mothers had heard of vitamin K, alarmingly 54% reported that they did not know anything about it and/or its involvement in the normal clotting of blood (**FIGURE 2**). Only 28% actually knew the role of vitamin K. The survey asked the mothers about the sources of their information on vitamin K prophylaxis (**FIGURE 3**); the majority reported receiving information during a discussion with a healthcare professional.

As shown in **FIGURE 4**, 92 mothers said they gave verbal consent for prophylaxis, five said they made an advanced decision and remember it being documented in their birth plan, and the remaining two were not sure whether they gave any consent.

Discussion

Reassuringly, 97% of mothers had heard of vitamin K, however only 28% understood the role it plays in their newborn infant's health even though the mothers completed the survey just days after their baby's birth.

Discussing vitamin K in labour

Nearly three-quarters (73%) of mothers remembered discussing vitamin K in labour, with 14% saying they were in too much pain or on some form of pain relief to comprehend what was being discussed. Of the mothers interviewed, a number were accompanied by their partners and on many occasions, the partner had more knowledge about vitamin K than the mother did. Mothers may have a reduced capacity to consent during labour whether due to distraction, pain or reduced

cognition because of analgesia.

Unplanned caesarean section may also contribute to this lack of comprehension as topics may be skipped or brushed over with the concern for the mother and baby's health taking priority.

Fourteen per cent of mothers claimed the information given to them was not detailed enough. Midwives may simplify their explanation to mothers depending on the capacity they are deemed to have during labour. One mother during labour was told: "Vitamin K is good for baby, as they don't produce it themselves."

Although true, this does not discuss the role of vitamin K, its purpose or why it is necessary. Although the level of information given at the time may have been sufficient, it is not detailed enough to qualify as a proper informed consent.

Five per cent of mothers were not sure whether their baby received any prophylaxis. We would like to assume that vitamin K had been discussed at some point during labour, as their notes confirm that their newborn had received the intramuscular prophylaxis. However, the nature of information sharing and consenting remains questionable.

Vitamin K prophylaxis leaflet

Of the 54% who said they received the information leaflet, 19% admitted to never reading it. With only 28% of mothers saying they understood the role of vitamin K, it suggests that the leaflet on its own may not be adequate to support the mothers' knowledge. Many of them suggested more information be given throughout the antenatal period and not just at the 20-week appointment, when they are only halfway through pregnancy; 8% said vitamin K was discussed 'long ago'.

Opting out

One mother considered opting for oral vitamin K over the injected preparation because of a concern regarding the risk of acute lymphoblastic leukaemia, which is mentioned in the advice leaflet. The leaflet refers to studies from 1990 that found a higher risk of childhood cancer and leukaemia in babies who had received vitamin K by injection, compared to those given it by mouth. These studies have been discredited[6-8] and the leaflet then goes on to say: "However, since then many doctors have disagreed with these results and there has been no link between vitamin K injections and childhood cancer reported from any other country in the world. A group of British experts recently agreed that the first results could have happened simply by chance."

It is likely that internet websites and forums may play a role in promoting discredited theories and perhaps the time has come to revise the leaflets to remove this outdated information as it causes confusion.

One mother opted out of prophylaxis altogether giving the reason: "Vitamin K prophylaxis administration is a fairly new protocol, babies have never required it before and my child will eventually produce it himself."

She thought it unnecessary for her baby to receive it; she was counselled by a number of midwives and doctors regarding the prophylactic benefits but this did not

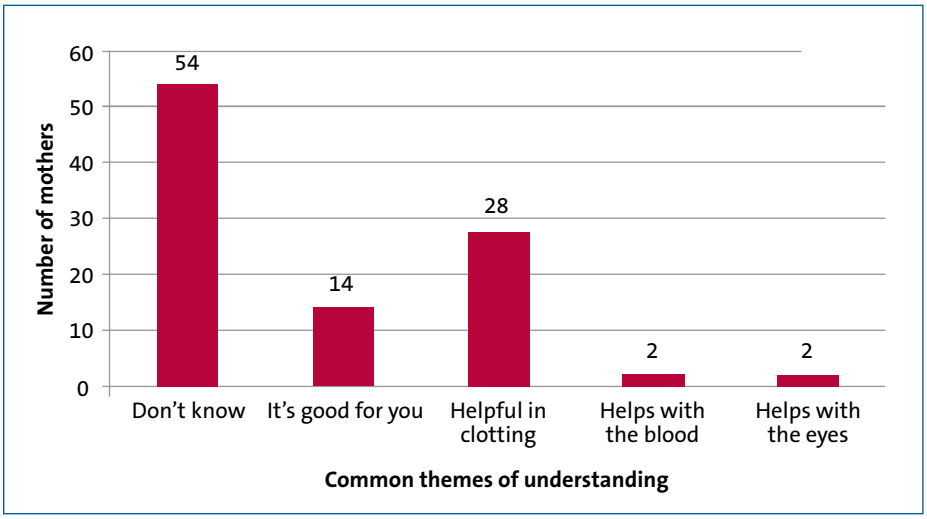

FIGURE 2 Mothers' understanding of the role of vitamin K.

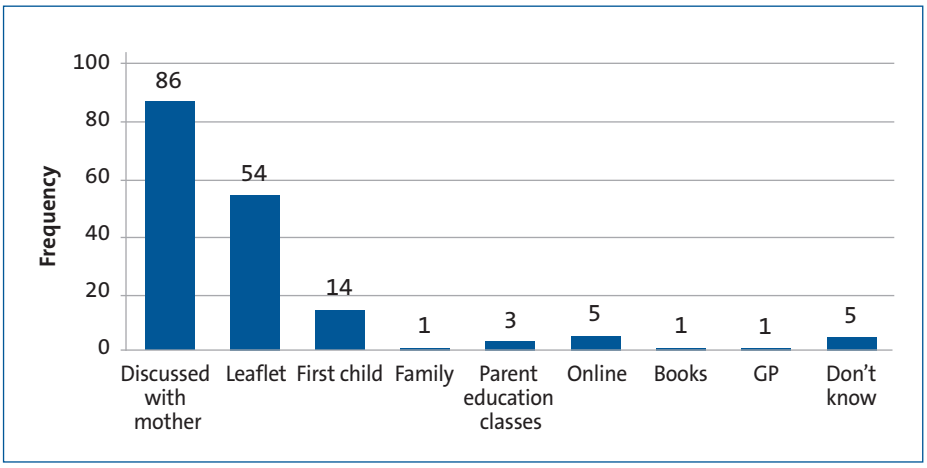

FIGURE 3 A graph showing the mothers' information sources for vitamin K prophylaxis.

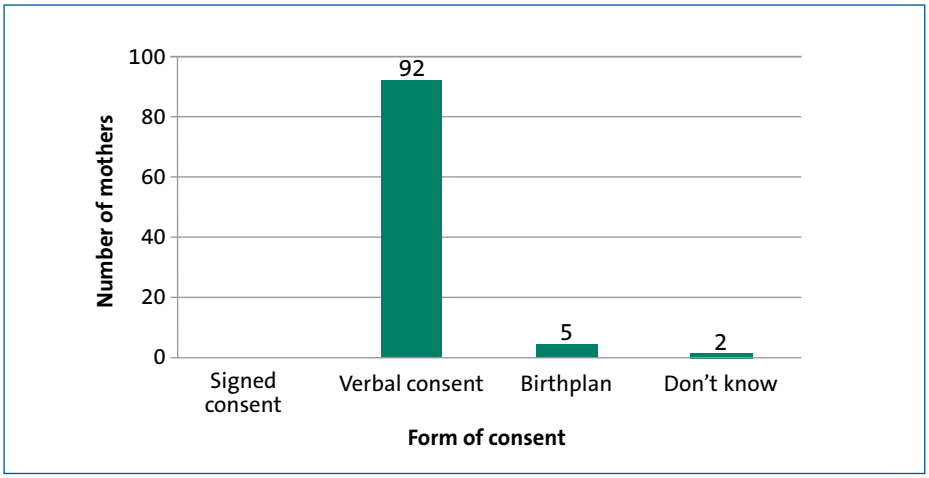

FIGURE 4 A graph showing the form of consent given for vitamin K prophylaxis.

influence her decision. She also said that her previous child was given vitamin K before she had the opportunity to consent, again questioning whether consent is always obtained.

Information sharing

There are a number of sources of information about vitamin K available to expectant mothers, including:

- patient advice leaflet
- online resources etc, eg parent forums, NHS Choices, patient.co.uk
- various maternity apps
- discussions with midwives (20-week appointment, antenatal classes, community midwife antenatal appointments and upon arrival at the labour ward).

Despite this, the information sharing process fails to achieve sufficient knowledge to enable informed consent.

The results indicate a need to improve information sharing tools to support mothers in their decision-making and to orchestrate improvements. Nearly 20% of mothers suggested that more information should be given in the antenatal period. The opportunities to do so are available but perhaps it might be a matter of modifying how the information is given. It may be possible to discuss prophylaxis in more depth during antenatal appointments and perhaps consent for vitamin K could be obtained during the prenatal period – the birth plan may be the better option for more mothers.

About a third of mothers thought labour was a good time to discuss vitamin K, but that perhaps it could take place after birth (17%). Vitamin K is expected to be given within the first hour of life,[4] which may allow time for recovery from labour and enable a more detailed discussion of vitamin K when the mother may have greater capacity to consent to treatment. However, the immediate post-birth period is often a busy time and this may not be ideal.

Multigravida mothers felt little information was given to them during subsequent births (56%), with only 25% remembering the purpose of vitamin K administration. The majority remembered their previous children receiving the prophylaxis and therefore felt it would be beneficial for their newborn baby.

This study did not consider any factors related to maternal socioeconomic status or level of education, however a previous study in which the majority of mothers had higher qualifications[9] found that two-thirds of mothers were knowledgeable about the reasons for giving vitamin K.

Conclusion, learning and next steps

This study provides an insight in to the concerns, mind-set and information sources used by mothers regarding the vitamin K prophylaxis programme and allows us to reflect on the effectiveness of our information sharing systems to educate parents. Although 97% of mothers had heard of vitamin K, less than a third understood its purpose. Despite information being available, it has not proven adequate to help mothers in their understanding with regards to vitamin K. Only a third of the mothers read the provided leaflet and this would suggest that the method in which the information is shared should be revised in order to support mothers' decisions regarding prophylactic treatment for their newborn infants.

While no single intervention strategy can improve the education and compliance of a population, realistic assessment of patients' knowledge and understanding of the regimen along with clear and effective communication between health professionals and their patients, helps in building up a relationship of trust that is pivotal in achieving patient compliance. It is important to understand the beliefs, attitudes, subjective norms, cultural context, social supports, and emotional health challenges, particularly in the postnatal period. Educating parents about the importance of intramuscular vitamin K prophylaxis should begin in the antenatal period, with documentation in the birth plans, use of multilingual leaflets and more parent-professional interactions. Use of social media and eye catching posters in antenatal counselling rooms may also serve as important additional tools to facilitate parental education.

From this service evaluation project it is clear to see that the proportion of mothers understanding the purpose of administering vitamin K is not sufficient. Therefore, it is reasonable to suggest that the information sharing process should be revised.

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