Implications of Parent Vitamin K & Immunization Refusal

Helen Russell, MSN NNP-bc
March 2016

OBJECTIVES

• Understand the physiologic purpose of Vitamin K
• Identify known advantages and disadvantage of vitamin K injection
• Recognize importance of evidence based literature in relationship of vitamin K
• Identify ways to have an open and educational discussions with parents on treatment options

Vitamin K

What brought Vitamin K to our attention?
Vitamin K

• Henrik Dam – Danish Biochemist
  • Studying cholesterol metabolism in chickens – with a diet free of sterol and low in fat sometimes developed subcutaneous and intramuscular hemorrhages
  • Further studies on different foods led to discovery of an anti-hemorrhagic factor and was named Vitamin K (K = “Koagulations-Vitamin”)

Vitamin K

• What is Vitamin K?
  – Members of Vitamin K group share a common ring
  – Naturally occurring compounds are Vitamin K1 and Vitamin K2
  – K1 is the primary source of vitamin K in humans
  – Acquired through diet and mostly present in green leafy vegetables and animal fats

Vitamin K

• Physiologic function
  – Essential for the function of several proteins involved in blood coagulation
    • Factor II, VII, IX, X, and protein C, S and Z
  – Poor Vitamin K status is a not only a risk factor for bleeding but for postmenopausal bone loss and arterial calcification.
Vitamin K

• Purpose (easier terms)
  – Vitamin K refers to a group of structurally similar fat-soluble molecules that are primarily involved in the synthetic pathways of a number of clotting factors.
  – Vitamin K also involved in bone metabolism

• Literature shows a very small amounts of vitamin K is needed in adults for blood coagulation. Deficiency is rare in adults.
  – Extreme inadequate diet intake
  – Intestinal disorders

• So why are infants at higher risk?

• Infants
  – Infants have very little Vitamin K in their bodies at birth because only small amounts of the vitamin pass through the placenta.
  – Also the bacteria that produces Vitamin K in the intestines are not yet present.
  – Breastmilk contains only low levels of Vitamin K
Vitamin K

• Infants
  – It may take weeks to months for infant’s gut to become established.
  – This predisposes the infant to have low Vitamin K levels.
  – This can result in low levels of vitamin K-dependent clotting factors — increasing risk for bleeding
  – Term: vitamin K deficiency bleeding

Vitamin K deficiency-related bleeding (VDBK)
  – Defined as a bleeding disorder in which the coagulation is rapidly corrected by vitamin K supplementation.
  – 3 Types
    • Early VDBK
    • Classical VDBK
    • Late VDBK

Vitamin K

• Early
  – Occurs within first 24 hours of life
  – Most commonly seen in infants whose Mother is taking a drug that inhibits vitamin K (anticonvulsants, anti-TB, & some antibiotics & blood thinners)
Vitamin K

• Early VKDB
  – Presentation
    • Can be severe with –
      – Cephalic Hematoma
      – Intracranial Hemorrhages
      – Intra-abdominal Hemorrhages
  – Incidence
    • 6%-12% in infants whose mothers were taking those drugs

Vitamin K

• Classical
  – Occurs between 24hrs and 7 days
  – Associated with delay in or insufficient feedings
  – Symptoms include bruising, GI bleeding, bleeding from umbilicus
  – There have been reports of intracranial bleeds although rare
  – Incidence – 0-0.44%

Vitamin K

• Late

  • Occurs between 2-12 weeks and up to 6 months in previously healthy infants

  • Presentation
    – Intracranial bleed
Vitamin K

- Late

- This life threatening event most often occurs in exclusively breastfed infants who have received no or inadequate vitamin K

- Warning bleeds before a severe event are rare!!

---

Vitamin K

- KEY POINT
  - Infants who do not get vitamin K shot at birth are at a 81 time greater risk for VKDB than those who do get the shot.
  
  - Incidence falls to 1/100,000 in infant receives vitamin K at birth.

---

Vitamin K

- AAP
  - In 2003 the AAP recommended that vitamin K 1 should be given to all neonates as a single IM dose 0.5mg – 1mg and dosing was reaffirmed in 2009
  
  - Other countries have followed a similar dosing plan
Vitamin K

• Disadvantages of vitamin K shot
  – In the early 1990s there was a publication of two retrospective studies that linked vitamin K injection to childhood leukemia and other cancers.
  – This study was debunked with two large retrospective studies in USA and Sweden that found no link between the injection and childhood cancer.

Vitamin K

The literature does not show any real disadvantages in an infant receiving the vitamin K injection

BUT.....

There is a lot of information against it on the internet and in blogs.

Vitamin K

• Myth or Evidence Based
  – Vitamin K does cross the placenta
    • Evidence: yes Vitamin K2 in small amounts but Vitamin K 1 does not and most needed for clotting
  – I can eat a vitamin K rich diet and increase my infants vitamin K levels
    • Evidence: You cannot eat enough vitamin K rich foods to give fetus levels they need. Although scientist do believe current nutrition practices do cause adults to have lower levels of vitamin K
Vitamin K

• Maternal Injections
  • Myth or Evidence based
  – This will increase maternal levels of vitamin K but no studies to show the fetus has increased levels in their system
  – Previously discussed vitamin K 1 does not cross the placenta.

Vitamin K

• Myth or Evidence Based

• Toxicity
  – Occurs in premature infants and infants with renal disease. Infants found to have high levels were premature infants (Kumar)
  – These infants receive smaller dosing based on weight
  – They are at higher risk for bleeding especially on the brain

Vitamin K

• Myth or Evidence Based

• Cancer
  – Evidence – the initial studies were proved to be inaccurate with two Large retrospective studies in USA and Sweden.
Vitamin K

- Myth or Evidence

- Pain
  - Evidence – true no one knows real long term on pain in infants and we know they feel pain. Although there have been no studies that confirm the “emotional wound” that infant has with the injection and are detrimental to a healthy adult life

Vitamin K

- Myth or Evidence
- Oral works as well
- Evidence
  - Oral vitamin K does work
    - Multiple doses are recommended first feed after birth and at 1,4 and 8 weeks of age
    - Exact dosing has not been identified

Vitamin K

- Oral
  - Small daily dosing to infants
  - Both requires commitment
  - No studies showing which dosing is most effective
  - No licensed oral dosing in US
  - Evidence shows that oral is less effective in late VKDB 2-12wks especially in exclusively breastfed infants
Vitamin K

- Breastmilk and vitamin K
  - In Japan – infants given oral vitamin K with some infants showing improvement
  - Mothers then were supplemented with oral vitamin K and infants improved
  - Vitamin K2 was the most successful in being transmitted through breastmilk in this study

Vitamin K

- Intracranial Bleed is rare
  - Evidence
    - 1.7%
    - Also reported 1/20,000
    - Number seems small
    - But that would be 2 out of every 100 live births (1.7%)
    - 50% of time intracranial hemorrhage was reported event
    - With a 20% mortality

Vitamin K

How do we help parents navigate
And make the best decision for them
And their infant??
Vitamin K

• As health care providers we have a duty to provide reliable information to parents about the benefits of vitamin K so they can make an informed choice about the infant's medical care.
• Debunk myths
• Protect the infant from possible severe consequences

Vitamin K

• Before we can help our parents in a decision-making process
• We must:
  – Identify our own beliefs
  – Be knowledgeable
  – Understand where information is coming from
    • Internet
    • Social Circles
    • Personal ideas

Vitamin K

• Decision making
  – Works best in a low stress situation
  – Open calm discussion
  – Listening
  – Digesting
  – Being informative
  – Leave your opinions at the door
Vitamin K

• Leave Your Opinion at the door!
  – We all carry a belief system that we have created based: regionally, family, religious and social circles
  – These beliefs over time have become how we make decisions
  – Some are based in fact, some in fiction but most are mixture of both

Vitamin K

• Low stress environment
  – The discussion of vitamin K administration should most likely happen during pregnancy
  – This gives time for parents to express concerns and provide literature
  – Giving the health care provider a chance to review information, share current scientific literature
  – Followed by open discussion

Vitamin K

• NOT a low stressful environment
  – Epidural placement
  – While mother pushing
  – During painful contraction
  – Immediately after infant is being placed in Moms arms and she is seeing her bundle of joy for the first time
  – Timing is everything.. for an open discussion where both parties can be heard
Vitamin K

• Listening
  – Most parents who may choose this option have acquired information on vitamin K injection
  – Once they have made wishes known
  – No eye rolling.…
  – Ask how they came to decision
  – Listen to them and ask can they share information with you

Vitamin K

• Listening
  – Look at it seriously
  – See where information was acquired
  – Identify information that maybe misleading
  – Ask if you can share some information with them
  – Make sure you are familiar with information you are sharing

Vitamin K

• Evidence based sites
  – AAP Website
  – CDC site
    • Has a very informative handout with necessary information
    • www.cdc.gov/vitamin-k.pdf
  – SC DHEC Website
Vitamin K

• I also found a lot of sites that quote medical information
• Some of information is tweaked or leave out data – and then represented to the view the writer believes to be correct
• Many parents maybe mislead by this information and believe it to be true.
• Important to recommend evidence based sites

Vitamin K

• Summary
  – Vitamin K is an important in coagulation and bone growth
  – The vitamin K injection does not cause cancer
  – Vitamin K does not cross placenta well
  – Supplements during pregnancy will not increase fetus levels

Vitamin K

• Summary
  – Exact oral dosing has not been identified in studies
  – Research has shown infants that are exclusively breastfed and do not receive vitamin K. Have an increased risk for Late Vitamin K deficiency-related bleeding
Vitamin K

What we do know is that vitamin K can prevent bleeding in infants that can cause devastating outcomes including death.

Immunizations

• Immunizations have taken a lot of heat over the past few years.

• Let's review the issues that people are concerned about.

• 8 Myths of vaccines

Immunizations

• Vaccines cause Autism
  – The link between autism and vaccines originated with a 1997 study published by Andrew Wakefield, a British surgeon. The article was published in *The Lancet*, a prestigious medical journal, suggesting that the measles, mumps, rubella (MMR) vaccine was increasing autism in British children.
Immunizations

• Autism
  – The paper has since been completely discredited due to procedural errors, undisclosed financial conflicts of interest, and ethical violations. Andrew Wakefield lost his medical license and the paper was retracted from The Lancet.
  – The theory was taken seriously, & several other major studies were conducted. None of them found a link between any vaccine and the likelihood of developing autism.

Immunizations

• Autism
  – Today, the true causes of autism remain a mystery, but to the discredit of the autism-vaccination link theory, several studies have now identified symptoms of autism in children well before they receive the MMR vaccine. And even more recent research provides evidence that autism develops in utero, well before a baby is born or receives vaccinations.

Immunizations

• Infant’s immune system can’t handle vaccines
  – Based on the number of antibodies present in the blood, a baby would theoretically have the ability to respond to around 10,000 vaccines at one time. Even if all 14 scheduled vaccines were given at once, it would only use up slightly more than 0.1% of a baby’s immune capacity.
Immunizations

• Natural immunity is better than acquired
  – In some cases, natural immunity — meaning actually catching a disease and getting sick— results in a stronger immunity to the disease than a vaccination.
  – If you wanted to gain immunity to measles, for example, by contracting the disease, you would face a 1 in 500 chance of death from your symptoms. In contrast, the number of people who have had severe allergic reactions from an MMR vaccine, is less than one-in-one million.

Immunizations

• Vaccines contain unsafe toxins
  – People have concerns over the use of formaldehyde, mercury or aluminum in vaccines. It's true that these chemicals are toxic to the human body in certain levels, but only trace amounts of these chemicals are used in FDA approved vaccines.
  – According to the FDA and CDC, formaldehyde is produced at higher rates by our own metabolic systems and there is no scientific evidence that the low levels of this chemical, mercury or aluminum in vaccines can be harmful.

Immunization

• Better hygiene is cause for less diseases
  – Vaccines don’t deserve all the credit for reducing or eliminating rates of infectious disease. Better sanitation, nutrition, and the development of antibiotics helped a lot too.
  – One example is measles in the United States. When the first measles vaccine was introduced in 1963, rates of infection had been holding steady at around 400,000 cases a year. And while hygienic habits and sanitation didn’t change much over the following decade, the rate of measles infections dropped precipitously following the introduction of the vaccine, with only around 25,000 cases by 1970.
Immunizations

• Vaccines are not worth the risk
  – Despite parent concerns, children have been successfully vaccinated for decades.
  – For example, only one death was reported to the CDC between 1990 and 1992 that was attributable to a vaccine. The overall incidence rate of severe allergic reaction to vaccines is usually placed around one case for every one or two million injections.

Immunizations

• Vaccine can infect infant with disease
  – Vaccines can cause mild symptoms resembling those of the disease they are protecting against.
  – A common misconception is that these symptoms signal infection. In fact, in the small percentage (less than 1 in one million cases) where symptoms do occur, the vaccine recipients are experiencing a body’s immune response to the vaccine, not the disease itself.
  – Only incidence that this occurred was with oral Polio which is no longer available

Immunizations

• Vaccines not needed because infection rates are low in U.S.
  – Thanks to “herd immunity,” so long as a large majority of people are immunized in any population, even the unimmunized minority will be protected. With so many people resistant, an infectious disease will never get a chance to establish itself and spread.
  – But if too many people don’t vaccinate themselves or their children, they contribute to a collective danger, opening up opportunities for viruses and bacteria to establish themselves and spread.
Immunizations

• Vaccines not needed because infection rates are low in U.S.
  ‒ Not to mention, as the Centers for Disease Control (CDC) warn, international travel is growing quickly, so even if a disease is not a threat in your country, it may be common elsewhere. If someone were to carry in a disease from abroad, an unvaccinated individual will be at far greater risk of getting sick if he or she is exposed.

Immunizations

• Vaccines are one of the great pillars of modern medicine. Life used to be especially brutal for children before vaccines, with huge portions being felled by diseases like measles, smallpox, whooping cough, or rubella, to name just a few. Today these ailments can be completely prevented with a simple injection.
  • So as science continues to advance and tackle new challenges, people should not forget how many deaths and illnesses vaccines have prevented, and how they continue to protect us from potentially devastating forms of infectious disease.

Summary

• In review of literature receiving vitamin K and immunizations benefits out weigh risks.
• Any treatment in healthcare often has a level of risks
• The literature shows these risks are minimal compared possible individual and community outcomes without them.
Summary

• It is important as healthcare providers to remain informed on current evidence based research.
• We must take our patients concerns seriously and listen to their opinions.
• We must also help them navigate through information and help them make informed decisions.

References

  – See reference list for other articles used in lecture
• pediatrics.aappublications.org/content/112/1/191
• Separating Fact From Fiction in the not so normal Newborn Nursey: Vitamin K Shot: Science Based Medicine: December 2013
• CDC website
• SC DHEC website
• Get A Vitamin K Shot? – www.mommypotamus.com
• www.publichealth.org/public...vaccines/vaccine-myths-debunked