MeritCare Medical Center

Aunt Cathy's Guide to: **5/2009**

Vitamin K --
Focus on the Vitamin K and Warfarin/Coumadin Anticoagulant Drugs Issue

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This paper is in response to the many questions I get from health care professionals about the problem of actual vitamin K insufficiency in many people already using these drugs. It is a follow-up clarification of the drug-nutrient interaction issue only, and it is intended only for health care professionals who have read my more complete paper on many aspects of the vitamin K inadequacy problem:

"Aunt Cathy's Guide to: Vitamin K --New Issues in Cardiovascular Health, Osteoporosis, Cancer of the Liver and Colon, Diabetes, Pregnancy & Varicose Veins. (Long version with abstracts attached)"

Question 1:

"What we should tell people already on Coumadin/warfarin regarding vitamin K?"

My Answer:

Here's our problem ... overt vitamin K deficiency is (unfortunately) common in this population and quite often unrecognized because it is rarely evaluated, either by lab tests or dietary evaluations. A great many multivitamin supplements do not even include vitamin K because (until recently) it had been assumed to be provided in adequate amounts by intestinal bacteria. It is not even included in the list of nutrients in the "mypyramid.gov" diet information. It is not in our radar.

Many health professionals are totally unaware of this. Some automatically tell patients to quit taking their multivitamins without checking to see if the product even contains any vitamin K. This is clearly not benign for many reasons, many of which are explained in another paper:

"Aunt Cathy's Guide: My Current Top Five Easy Ways to Improve Your Family's Nutrition (subject to change at any moment! ☺)"

Back to the topic: Normally dietitians are dead-set against allowing any actual vitamin deficiency diseases in their patients, and now that we know it is such a big problem, we want to fix it. **But we are usually not in control of this situation.**

It needs to be corrected because vitamin deficiency hurts people in several different ways, both related to the coagulation issue and also related to a number of other serious complications of inadequacy (arteriocalcinosis, liver and colon cancer, osteoporosis, diabetes, arthritis, etc.)

However, if patients are already on this drug AND they are vitamin K deficient, the doctor (or PA or NP) has to be the one in charge of incrementally improving the vitamin K status.

This can be accomplished most effectively (because of consistency) with a regular (daily) supplement. That should be pretty easy to do ... just walk the amount up incrementally and monitor coagulation while doing it and adjusting the dosage of medication. But if the doctor doesn't "believe in" this new research there is not a thing we can do about it. **We can't tell patients to add a bunch (even a "consistent" bunch) of vitamin K because it might cause problems for a person whose coagulation balance was calculated counting on a baseline vitamin K deficiency state.**

Question 2:

"What if the person is not yet on Coumadin/warfarin but he/she may be put on this medication?"

If a person is contemplating going on Coumadin, it is of course safe to beef up their vitamin K intake "up front" to a consistent "assured adequacy" amount. Then the person prescribing it simply sets the new drug prescription based on the underlying consistent and adequate vitamin K status. That would be ideal. (Actually, ideal would be a situation in which nobody had vitamin K insufficiency to begin with. ☺)

Nutrition folks need to have a clear understanding that vitamin K is not a scary nutrient. It is just that there is an important drug/nutrient interaction that needs attention when people are put on that particular drug. We also need to be very aware that low vitamin K can also increase the dangerous volatility of a warfarin patient's blood coagulation. (This is another reason why vitamin K deficiency is NOT benign.)

Vitamin K is only a safety issue in relation to folks on this medication. Vitamin K does not "make you" coagulate your blood. It's just a tool (a vitamin cofactor) that needs to be there for normal coagulation to take place. (Other things set coagulation into motion, like thromboxanes, etc.) **There is no upper level of safety even established for this vitamin in its natural form (Vitamin K-1 philoquinone and Vitamin K-2 menaquinone) because no problems have ever**

been seen apart from the altered situation that exists when a person is prescribed a warfarin/Coumadin type of anticoagulant medication. They are of a class called "vitamin K antagonists" because they exert their influence on the vitamin K piece of the process of coagulation.

However, all we can really do about vitamin K for people on warfarin or those about to start warfarin is to share this new information with the people in charge of prescribing their medications.

An additional note:

This discussion is only about the importance of simple nutritional adequacy of vitamin K in relation to warfarin use. It is not addressing therapeutic applications of high-dose vitamin K as a treatment for warfarin overdose or drug-related bleeding. That intervention is not a nutrition-related use of vitamin K but a pharmacologic use in an acute situation. It is outside of the scope of this discussion.

Another additional note:

There are other types of medications sometimes used to decrease risk of inappropriate blood clotting that do **not** interact with vitamin K, such as "antiplatelet agents" (some are listed below.) This is mentioned here to be sure that nutrition people recognize that inducing vitamin K inadequacy by restricting intake is especially inappropriate when the medication does not operate as a vitamin-K antagonist at all.

Antiplatelet Agents

Generic Name	Trade Names
Clopidogrel	Plavix
Ticlopidine	Ticlid
Dipyridamole	Persantine
Dipyridamole ER plus aspirin (25mg)	Aggrenox

Similarly, the nutritional intervention of decreasing the ratio of omega-6 to omega-3 fats in the diet has the ability to decrease clotting time because it alters the strength of thromboxanes produced. Again, vitamin K is not involved in this effect. Thromboxanes made from the omega-6 fatty acid arachidonic acid (ARA) are much more aggregatory than are those made from the

omega-3 fat eicosapentaenoic acid (EPA.) [A good way to remember this is that "the bigger number (that is 6, which is bigger than 3) is associated with the bigger aggregator effect."]

The American diet typically provides about 10 to 20 omega-6 fats for every omega-3 fat. In societies that regularly have intake ratios of about 4 omega-6 fats per omega-3 fat (such as those eating the "Mediterranean Diet,") the problem of excessive and inappropriate clotting is much less common. It benefits other health parameters as well. **While change in the 4:1 ratio direction has been shown to be an excellent idea overall for general health (including cardiovascular health,) this form of intervention needs to be discussed with physicians/Pas/NPs if they are treating a person with any anti-clotting medication.** Actually, the dietary change can sometimes make it unnecessary to be on anti-clotting medications at all, but as before, **incorporating this kind of diet change also needs to be managed by the person prescribing the medication.**

FYI: Here's the recommendation from page 2 of my "Top Five" handout about this:

"The dark leafy veggies are also terrific sources of vitamin K, a nutrient just now being recognized as critical to decrease risk of osteoporosis, cardiovascular disease, kidney stones, liver cancer and arthritis. It is also a nutrient found to be low in the diets of many Americans. It appears that the elderly need more than the current RDA of 90-120 mcg/day. This information is so new that vitamin K is not even included in most multivitamins currently on the market, and many health professionals will not yet have heard about these new issues.

[Vitamin K: The coagulation vitamin that became omnipotent. Thromb Haemost. 2007 Jul;98(1):120-5.]

If you are taking medications to prevent blood clots, be sure to show this information to your doctor before adding more vitamin K–rich vegetables to your diet or taking any vitamin K supplements. New research on the relationship between vitamin K and these drugs will result in changes in how we do things. But because the information in support of these changes is very new, it will also be new to many healthcare providers, so I have put a 'Vitamin K" handout on line that includes all the scientific references and detail. Your doctor would want to read more about it before he/she decides to make any changes in your personal diet or medication regimen."

A few related references from the larger Vitamin K paper also cited on page 1 above: [Abstracts are also available.]

I. Inadequacy of Vitamin K: Contribution to Unsafe Variability of Anticoagulation Therapy

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