

Vitamin k deficiency: Causes, symptoms, and prevention.

Rajiv Singhania*

Department of Food Engineering, Indraprastha University, India

Introduction

Vitamin K is a crucial nutrient that plays a vital role in blood clotting and bone health. Despite its importance, vitamin K deficiency is relatively rare but can lead to severe health problems if left untreated. This article delves into the causes, symptoms, and prevention strategies for vitamin K deficiency, emphasizing its significance in maintaining overall health [1].

Vitamin K exists in two primary forms: vitamin K1 (phylloquinone) and vitamin K2 (menaquinone). Vitamin K1 is predominantly found in green leafy vegetables, while vitamin K2 is present in fermented foods and produced by gut bacteria. Both forms are essential for the synthesis of proteins involved in blood clotting and bone metabolism [2].

Vitamin K deficiency can arise from several factors. One common cause is inadequate dietary intake, especially in individuals who do not consume enough green leafy vegetables or fermented foods. Other causes include malabsorption disorders, such as celiac disease, Crohn's disease, and cystic fibrosis, which impair the body's ability to absorb fat-soluble vitamins like vitamin K. Long-term use of antibiotics can also disrupt gut bacteria, reducing vitamin K2 production [3].

Certain populations are more susceptible to vitamin K deficiency. Newborns are particularly at risk due to low stores of vitamin K at birth and limited transfer of the vitamin from the mother during pregnancy. Breastfed infants might also be at risk since breast milk contains low levels of vitamin K. Additionally, individuals with chronic gastrointestinal conditions or those on prolonged antibiotic therapy are more vulnerable [4].

The primary symptom of vitamin K deficiency is excessive bleeding or hemorrhage due to impaired blood clotting. This can manifest as easy bruising, frequent nosebleeds, bleeding gums, and prolonged bleeding from cuts. In severe cases, internal bleeding can occur, presenting as blood in the urine or stool, or even intracranial hemorrhage. Deficiency can also lead to weakened bones and increased risk of fractures due to impaired bone metabolism [5].

Diagnosing vitamin K deficiency typically involves blood tests to measure prothrombin time (PT) and international normalized ratio (INR), which assess blood clotting ability. Prolonged PT and elevated INR indicate a potential deficiency. Additionally, measuring vitamin K levels directly in the blood can provide more specific information [6].

The primary treatment for vitamin K deficiency involves replenishing the vitamin through dietary changes and supplementation. For mild deficiencies, increasing the intake of vitamin K-rich foods, such as kale, spinach, broccoli, and fermented soy products, can be effective. In more severe cases, oral or injectable vitamin K supplements may be necessary. Newborns at risk of deficiency are commonly given a vitamin K injection shortly after birth to prevent bleeding complications [7].

Preventing vitamin K deficiency involves maintaining a balanced diet that includes sufficient amounts of vitamin K-rich foods. Individuals with conditions that affect nutrient absorption should work closely with healthcare providers to manage their health and consider appropriate supplementation. For those on long-term antibiotic therapy, monitoring vitamin K levels and adjusting intake as needed can help prevent deficiencies [8].

Beyond its critical role in blood clotting, vitamin K is essential for bone health. It helps regulate calcium deposition in bones and prevents calcium from accumulating in soft tissues. Vitamin K2, in particular, activates osteocalcin, a protein that binds calcium to the bone matrix, promoting bone strength and reducing the risk of fractures and osteoporosis [9].

Emerging research suggests that vitamin K may also play a role in cardiovascular health. By preventing calcium buildup in arteries, vitamin K2 can help maintain vascular elasticity and reduce the risk of arterial stiffness and cardiovascular diseases. Ensuring adequate vitamin K intake may therefore contribute to both bone and heart health [10].

Conclusion

Vitamin K is a vital nutrient with essential roles in blood clotting, bone health, and potentially cardiovascular health. While deficiency is relatively rare, it can lead to serious health complications if not addressed. Understanding the causes, recognizing the symptoms, and implementing effective prevention and treatment strategies are crucial for maintaining adequate vitamin K levels. By prioritizing a diet rich in vitamin K and working with healthcare providers when necessary, individuals can support their overall health and well-being.

References

1. Phillippi JC, Holley SL, Morad A, Collins MR. Prevention of vitamin K deficiency bleeding. *Journal of Midwifery & Women's Health*. 2016;61(5):632-6.

*Correspondence to: Rajiv Singhania, Department of Food Engineering, Indraprastha University, India, E mail: rajiv@indraprastha.edu.in

Received: 05-June-2024, Manuscript No. AAFFN-24-139064; Editor assigned: 08-June-2024, PreQC No. AAFFN-24-139064 (PQ); Reviewed: 19-June-2024, QC No. AAFFN-24-139064; Revised: 20-June-2024, Manuscript No. AAFFN-24-139064 (R); Published: 24-June-2024, DOI:10.35841/aaafn-7.3.210

2. Innis MD. Vitamin K deficiency disease. *J Orthomol Med.* 2008;23(1):15-20.
3. Dam H. Vitamin K. In *Vitamins & Hormones* 1948. Academic Press.
4. Dong R,. Review on Vitamin K Deficiency and its Biomarkers: Focus on the Novel Application of PIVKA-II in Clinical Practice. *Clinical Laboratory.* 2018;64(4).
5. Ozdemir MA,. Late-type vitamin K deficiency bleeding: experience from 120 patients. *Child's Nervous System.* 2012;28:247-51.
6. Sutor AH, Dages N, Niederhoff H. Late form of vitamin K deficiency bleeding in Germany. *Klinische Pädiatrie.* 1995;207(03):89-97.
7. Ardell S, Offringa M,. Prophylactic vitamin K for the prevention of vitamin K deficiency bleeding in preterm neonates. *Cochrane Database of Systematic Reviews.* 2018(2).
8. Lipsky JJ. Nutritional sources of vitamin K. In *Mayo Clinic Proceedings* 1994. Elsevier.
9. Card DJ, Gorska R, Harrington DJ. Laboratory assessment of vitamin K status. *J Clin Pathol.* 2020;73(2):70-5.
10. Tsugawa N, Shiraki M. Vitamin K nutrition and bone health. *Nutrients.* 2020;12(7):1909.