Vitamin K is a group of structurally similar, fat-soluble vitamins that the human body needs for modification of certain proteins that are required for blood coagulation, and in bone and other tissue.

Vitamin K acts as a cofactor in the post-translational carboxylation of glutamate residues to γ -carboxylglutamates in the N-terminal regions of the vitamin K-dependent proteins.

The aim of study was to describe current approaches and to guantify variability between European intensive care units (ICU)s in patients with traumatic brain injury (TBI). Therefore, Huijben et al. conducted a provider profiling survey as part of the 'Collaborative European NeuroTrauma Effectiveness Research in Traumatic Brain Injury' (CENTER-TBI) study. The ICU Questionnaire was sent to 68 centers from 20 countries across Europe and Israel. For this study, they used ICU questions focused on 1) hemoglobin target level (Hb-TL), 2) coagulation management, and 3) deep venous thrombosis (DVT) prophylaxis. Sixty-six centers completed the ICU questionnaire. For ICU-patients, half of the centers (N= 34; 52%) had a defined Hb-TL in their protocol. For patients with TBI, 26 centers (41%) indicated a Hb-TL between 70 and 90 g/l and 38 centers (59%) above 90 g/l. To treat trauma related hemostatic abnormalities the use of fresh frozen plasma (N = 48; 73%) or platelets (N = 34; 52%) was most often reported, followed by the supplementation of vitamin K (N = 26; 39\%). Most centers reported using DVT prophylaxis with anticoagulants frequently or always (N = 62; 94%). In the absence of hemorrhagic brain lesions, 14 centers (21%) delayed DVT prophylaxis until 72 hours after trauma. If hemorrhagic brain lesions were present, the number of centers delaying DVT prophylaxis for 72 hours increased to 29 (46%). Overall, a lack of consensus exists between European ICUs on blood transfusion and coagulation management. The results provide a baseline for the CENTER-TBI study and the large between-center variation indicates multiple opportunities for comparative effectiveness research ¹⁾.

Indications

To reverse elevated PT (prothrombin time) from warfarin give an aqueous colloidal solution of vitamin K1 (phytonadione, Mephyton®). Doses > 10 mg may produce warfarin resistance for up to 1 week. Fresh frozen plasma (FFP) may be administered concurrently for more rapid correction.

R adult: start with 10–15 mg IM; the effect takes 6–12 hrs (in the absence of liver disease). Repeat the dose if needed. The average total dose needed to reverse therapeutic anticoagulation is 25–35 mg. IV administration has been associated with severe reactions (possibly anaphylactic), including hypotension and even fatalities (even with proper precautions to dilute and administer slowly), therefore IV route is reserved only for situations where other routes are not feasible and the serious risk is justified. R IV (when IM route not feasible): 10–20 mg IV at a rate of injection not to exceed 1 mg/min (e.g., put 10 mg in 50 ml of D5 W and give over 30 minutes).

Vitamin K deficiency

Vitamin K deficiency bleeding is an acquired coagulopathy in newborn infants because of accumulation of inactive vitamin K-dependent coagulation factors, which leads to an increased

bleeding tendency. Supplementation of vitamin K at birth has been recommended in the United States since 1961 and successfully reduced the risk of major bleeding. Refusal or omission of vitamin K prophylaxis is increasing and puts newborn infants at risk for life-threatening bleeding.

The mean age of the seven infants with vitamin K deficiency was 10.3 weeks (range, 7-20 weeks); manifestations ranged from overt bleeding to vomiting, poor feeding, and lethargy. None of the infants had received vitamin K at birth, and all were found to have profound derangement of coagulation parameters, which corrected rapidly with administration of vitamin K in IV or intramuscular form. Four of the seven infants had intracranial hemorrhage; two of these infants required urgent neurosurgical intervention.

Supplementation of vitamin K at birth for all newborns prevents major hemorrhagic complications, such as intracranial bleeding, due to vitamin K deficiency. Parental refusal of vitamin K is increasingly common. It is critical that health care providers and the public be made aware of the varied presentation of this preventable acquired coagulopathy²⁾.

Vitamin K antagonist

see vitamin K antagonist

1)

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