

Case Study: Warfarin reversal before surgery

Both the AABB (formerly the American Association of Blood Banks) and the Canadian Society for Transfusion Medicine have addressed non-urgent warfarin reversal in their Choosing Wisely lists (1, 2). Both advise that non-urgent warfarin reversal is best managed by the use of Vitamin K alone. Prothrombin complex concentrate (PCC) or frozen plasma (FP), with intravenous Vitamin K, may be used in situations of serious bleeding, or when the need for surgery is urgent (within 6 hours), but FP should be used in these situations only when prothrombin complex concentrates are unavailable or contraindicated.

Multiple guidelines for warfarin reversal with Vitamin K have been published in the United States (3), Britain (4), and Australia/New Zealand (5), and they are well-summarised in a recent paper explaining the rationale for the AABB Choosing Wisely list (6). The use of 5-10 mg of intravenous Vitamin K, as soon as it was apparent that the patient would be undergoing a surgical procedure, would have been the most appropriate management of this patient, avoiding the need for any exposure to blood products and their inherent risks.

This patient's surgery was performed approximately 36 hours post-presentation, allowing ample time for warfarin reversal with Vitamin K alone, without the use of blood products. Oral Vitamin K would have reversed her anticoagulation within 24 hours, and intravenous Vitamin K would have had the same effect in 8 to 12 hours (7). Following administration of Vitamin K, the INR should be checked the next day to determine if additional doses are required. Even if the need for warfarin reversal had been urgent (within 6 hours), FP is not the appropriate choice of blood product, because PCC was available and not contraindicated. The risks of frozen plasma transfusion include transfusion-associated circulatory overload (TACO), transfusion related acute lung injury, allergic reactions, and others. It has been shown that the risk of TACO in the perioperative population may be as high as 3% (8). PCC (with intravenous Vitamin K) is preferable to FP (with intravenous Vitamin K) for urgent warfarin reversal because of its low reconstituted volume, rapid availability from the blood bank (no need for thawing), lack of requirement for ABO compatibility, rapid infusion rate, and superior INR correction. The risk of thromboembolic complications with PCC is about 2% (9).

Obtaining informed consent before transfusion includes explaining to the patient her alternatives to blood product transfusion. In this case, there was a safer alternative – Vitamin K therapy for temporary reversal of her anticoagulation. She did not require blood product transfusion.

References:

1. <http://www.choosingwisely.org/societies/american-association-of-blood-banks/>
2. <http://www.choosingwiselycanada.org/recommendations/transfusion-medicine/>
3. Holbrook A, et al. Evidence-based management of anticoagulant therapy: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-based Clinical Practice Guidelines. *Chest* 2012;141:e152S-184S
4. Keeling D, et al. Guidelines on oral anticoagulation with warfarin – fourth edition. *Br J Haematology* 2011;154:311-324
5. Tran HA, et al. An update of consensus guidelines for warfarin reversal. *Med J Australia* 2013;198:198-199.
6. Callum J, et al. The AABB recommendations for the Choosing Wisely campaign of the American Board of Internal Medicine. *Transfusion* 2014;54:2344-2352
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9. Dentali F, et al. Safety of prothrombin complex concentrates for rapid anticoagulation reversal of Vitamin K antagonists: A meta-analysis. *Thrombosis and Haemostasis* 2011;106:429-438.