Response to Letter Regarding Article, “Management and Outcomes of Major Bleeding During Treatment With Dabigatran or Warfarin”

We thank Hifumi et al for their comments on our article.1 It is important to recognize that treatment of major bleeding on warfarin in the 5 phase III trials was according to local hospital guidelines and protocols, which are generally based on international recommendations.2 The low reversal rate of warfarin is surprising but reflects the way warfarin-associated bleeding was managed at the emergency departments where these patients were seen. We were able to capture information on treatment with blood products or any coagulation factor concentrates accurately because such information was available both from transfusion journals, case report forms, and adverse event narratives. It is however possible that treatment with vitamin K as well as repeated dosing were underreported, including for patients in the intensive care units (ICU), as details of vitamin K treatment were not captured in the case report forms. It is common practice in ICUs to order blood tests once or several times daily and to correct any residual or rebound coagulopathy with necessary measures, including repeated administration of vitamin K. It is therefore less likely that warfarin coagulopathy was not properly reversed in patients in the ICU.

Circulating hypo-carboxylated proteins might be a better indicator than actual vitamin K levels when it comes to biochemical assessment of vitamin K status.3 Nevertheless, neither such analyses nor of vitamin K are available on an emergent basis in the majority of hospitals.

In a cohort study with 107 warfarin-treated patients with asymptomatic international normalized ratio (INR) of 10.0 to 26.6 (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day (acknowledging the inaccuracy of INR at these levels), a dose of 2.5 mg vitamin K provided substantial decrements of the INR after 1 day.

In summary, although warfarin reversal is not a problem, bleeding is, especially when managed in ICUs. Warfarin reversal is fast and effective, but bleeding control is challenging.

Disclosures

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References

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