Vitamin K in Cirrhotic Bleeders: Re-evaluating Administration Prior to GI Intervention in the MICU

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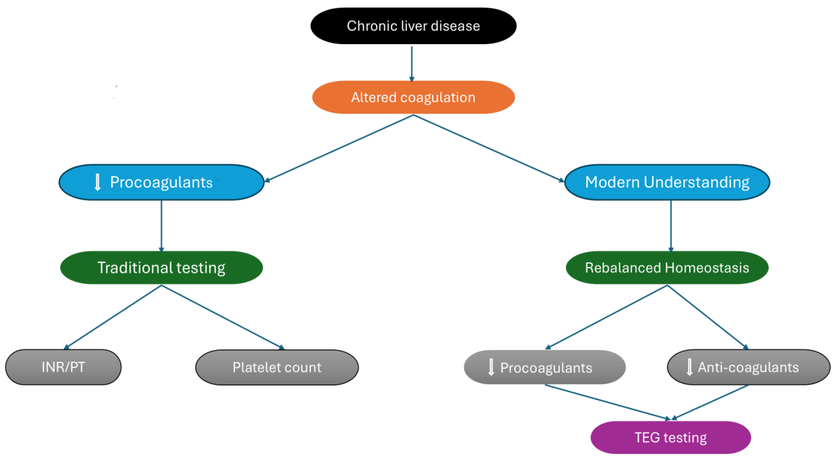
BACKGROUND: Why did you choose this project?

- Patients with chronic liver disease (CLD) were traditionally considered to be in a hypocoagulable state.
- Literature supports rebalanced homeostasis with a simultaneous decrease in both procoagulants and anticoagulants factors leading to an increased risk of bleeding and thrombosis.
- Conventional laboratories historically used to guide management of active bleeds in CLD:

Platelet Count	International Normalized Ratio (INR)	Prothrombin Time (PT)

- CLD patients often have an elevated INR.
- Administration of Vitamin K (VK) to reverse coagulopathies has been linked to increased re-bleeding and clotting in CLD.
- Thromboelastography (TEG) is an alternative tool to help guide administration of blood products in CLD patients with active hemorrhage.
- We chose this project to assess outcomes of TEG-guided versus INR-guided VK supplementation in CLD patients with active GI bleeds in the medical intensive care unit (MICU).



OBJECTIVE:

To obtain a TEG in patients with CLD admitted to the MICU with an acute GI bleed prior to administration of VK. The goal was to decrease non-indicated administration of VK by 40% and reduce the rebleeding and thrombosis risk post-VK administration by 15% by December 31st, 2024.

IMPROVEMENT ACTION PLAN WITH ACTIONS TAKEN:

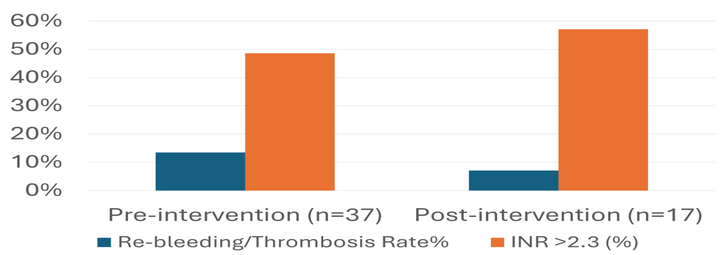
What did you do to improve?

- Setting: CLD patients admitted to the MICU with GI bleeds. Team members included internal medicine residents, GI fellows, and pulmonary & critical care fellows.
- Barriers: Active participation by residents and fellows which was overcome with afternoon reports for the medicine residents and written guidance for the fellows.
- Actions: Fellows were educated on ordering TEGs if patients met inclusion criteria. VK administration was then evaluated pre- and post-education and project implementation.

RESULTS: What did you find?

- The Pre-Intervention group included those that received VK based on elevated INR (n=37).
- The Post-Intervention group included those that received VK based on TEGs (n=14)

	Rebleeding or Thrombosis Rate	INR > 2.3
Pre-intervention (n=37)	13.5%	48.6% (18)
Post-intervention (n=14)	7.1%	57.1% (8)



- We were successfully able to decrease rebleeding and thrombosis rates in this tenuous population by 6.4%, with a relative risk reduction of 47.6%.
- While this was less impressive, we speculate that with a longer timeframe and larger data size, this number will increase.
- We decreased the percentage of CLD patients with GI bleeds who received non-indicated VK by 100%.

SCALE UP PLAN: How would you spread this to rest of your unit or other hospital units?

- We plan to include a lectureship series to all of the ICU staff, not just those in the medical ICU.
- Plan for stronger emphasis on TEG training among residents rotating through the ICU's including introduction during orientation trainings and continued learning through lectureship series.

SUSTAINABILITY PLAN: How would you assure this work continues following the same standards?

- We intend to provide a protocol for TEG-guided VK administration for patients who meet the inclusion criteria.
- The protocol will first be hung up in the MICU resident workroom and the data will be followed over the course of the next year to see if there are improvements over that timeframe.
- If there are improvements, this project will be expanded to the other ICUs.
- Additionally, given that 25cc of IV VK is approximately $500, decreasing the administration of this product will save the hospital system significant money over the course of multiple years. Therefore, not only is this intervention beneficial for patient care in reducing adverse events (rebleeding/thrombosis), it is also cost-effective.

LESSONS LEARNED:

- TEG-guided VK administration may decrease the rebleeding and thrombosis risk in CLD patients and may reduce morbidity and mortality.
- TEG-guided administration of VK may reduce the overall cost expenditure in reducing the cost of medication given.

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