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VTE prophylaxis administration in trauma patients: we are still behind the eight ball

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The authors should be commended for addressing this important question regarding the implementation of a pharmacist-driven, low-molecular-weight heparin (LMWH) dosing protocol. The burden of venous thromboembolism (VTE) and LMWH dosing regimens in trauma is well studied. However, previous data have shown that up to one-third of trauma patients on 'standard' 30 mg two times per day LMWH have subprophylactic anti-Xa levels.[1–3] Furthermore, studies have found mixed results regarding the impact of anti-Xa level-based dosing on VTE rates.[4–6]

Niziolek *et al* add to the growing body of literature on this topic. The authors found that in this intensive care unit (ICU) trauma population, nearly 40% of those who reached target anti-Xa levels were *not* on traditional 30 mg two times per day dosing. Furthermore, there was no difference in VTE regardless of anti-Xa level, LMWH dose, nor adherence to dosing protocol. Notably, almost 67% of the critically ill trauma patients did not receive LMWH during their ICU admission.[7] The rationale for lack of chemoprophylaxis is not apparent and may not be representative of critically ill trauma populations across other centers. Perhaps, this group precluded chemoprophylaxis due to solid organ injuries, traumatic brain injuries, spinal cord injuries, or ongoing bleeding concerns; hence had chemoprophylaxis initiated post-ICU period or died prior to initiation. Nevertheless, more data regarding VTE and current chemoprophylaxis prescribing practice patterns would be valuable.

It remains unclear why anti-Xa levels are inconsistently associated with VTE prevention. Perhaps there are mitigating patient factors which are incompletely understood contributing to this finding, especially in an ICU population with concomitant metabolic derangements and varying creatinine clearance. Additionally, as alluded to by the authors, assessment of the non-ICU trauma population may have demonstrated a favorable correlation between incidences of VTE and LMWH dosed to prophylactic anti-Xa level.[7]

One challenge of anti-Xa-based LMWH dosing regimens is ensuring precise timing of peak/trough levels. Niziolek and colleagues achieved 91% compliance with their dosing protocol, a credit to the ICU pharmacists at their institution.[7] While impressive, the reproducibility of this initiative at other less resource rich institutions may present challenges with compliance, as well as accuracy of peak/trough level timing.

In summary, although LMWH is well established as the agent of choice for VTE chemoprevention, the optimal dosing strategy is still uncertain. Questions regarding patient factors contributing to VTE while on chemoprophylaxis, anti-Xa level monitoring and VTE outcomes, as well as institutional protocols around dose monitoring persist.

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