Weighing up our options in venous thromboembolism prophylaxis prescribing

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Introduction

- Venous thromboembolism (VTE) is a leading preventable cause of death during hospital admission.[1]
- Enoxaparin dosing for VTE prophylaxis in extremes of body habitus is underrepresented in studies.[1]
- Patients weighing <45kg dosed with enoxaparin 40mg daily, as recommended by the Australian Commission on Safety and Quality in Healthcare Clinical Care (ACSQHC) Standards, demonstrated supratherapeutic anti-factor Xa levels.[1]
- Patients with body mass index (BMI) >35 had double the VTE incidence of non-obese patients when administered enoxaparin 40mg subcutaneously daily.[1]
- Local guidelines recommend enoxaparin 30mg subcutaneously daily for patients weighing <40kg or BMI <18.5 and enoxaparin 40mg subcutaneously 12-hourly when BMI >40.[2]
- The St Vincent's Hospital Prevention, Diagnosis and Management of Venous Thromboembolism (VTE) policy recommends that patients with low body weight (<50kg or BMI <18.5) and creatinine clearance (CrCl) >30mL/min are dosed with enoxaparin 30mg subcutaneously daily, and patients with BMI >40 and CrCl >30mL/min are dosed with enoxaparin 40mg subcutaneously 12-hourly.[7]

Aim

To determine if orthopaedic and general medicine patients are prescribed appropriate VTE prophylaxis based on weight.

Method

Study design: Retrospective audit conducted through scanned Medical Records Online (MRO).

Inclusion: Admitted to SVHM orthopaedic and general medicine units between 06/06/22 and 20/06/22. (n=124)

Exclusion: Patients <16 years of age, admitted ≤24 hours, patient records unavailable. (n=2)

Data collection: Patient admission record, national inpatient medication chart, pathology records and weight chart.

Data analysis: Assessed whether VTE prophylaxis was charted according to: VTE risk, renal function and body habitus; classified the types of errors, analysed prescribing trends and error rate in patients with extreme body habitus.

Results

A total of 124 patients were identified, with 73% from general medicine (n=91) and 27% from orthopaedics (n=33).

The audit population was 64% female with a median age of 78.5 years.

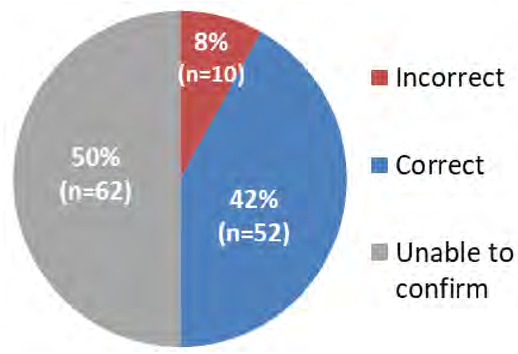

Figure 1. Proportion of patients prescribed VTE prophylaxis according to the clinical guidelines (n=124)

50% could not be assessed appropriately due to incomplete documentation of weight (37% of patients) and height (47% of patients).

Enoxaparin 40mg 12-hourly was indicated for two patients (1.61%) and enoxaparin 30mg daily was indicated for four patients (3.22%). However, only three of these patients who required dose adjustments were prescribed accordingly.

BMI <18.5	What prophylactic regimen was charted	According to policy?
Patient 1	Enoxaparin 20mg daily	✗
Patient 2	Enoxaparin 30mg daily	✓
Patient 3	Enoxaparin 40mg daily	✗
Patient 4	Pre-existing anticoagulant	✓

Table 1. Prescribing trends for BMI <18.5 who should receive enoxaparin 30mg daily according to policy

BMI >40	What prophylactic regimen was charted	According to policy?
Patient 5	Enoxaparin 60mg daily	✗
Patient 6	Enoxaparin 40mg 12-hourly	✓

Table 2. Prescribing trends for BMI >40 who should receive enoxaparin 40mg 12-hourly according to policy

A patient with a documented medical history of "morbid obesity" was charted enoxaparin 40mg daily. No weight or height was documented during the admission.

Overall, enoxaparin 40mg subcutaneously daily was the most prescribed VTE prophylaxis (62%).

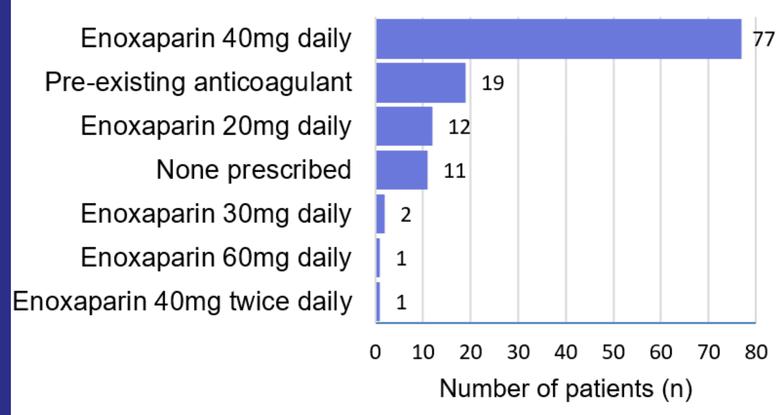

Figure 2. Prescribing trends in orthopaedics and general medicine unit

Discussion

- Assessment of accurate VTE prophylaxis was limited by lack of documented height and weight and estimation of these parameters by observing the patient was likely to be inaccurate.
- Enoxaparin 30mg is administered from 60mg graduated syringes.[3] The need to discard 0.3mL from the pre-filled syringe risks medication dosage errors and increases wastage and cost to the healthcare system.
- The ACSQHC standards do not endorse enoxaparin dosing for extremes of body weight and renal impairment. Prescribers may not be aware to check local policy for dosing recommendations.[1,2,3]

Figure 3. Clexane® 40mg safety-lock syringe[4]

Implications

- Pharmacists can educate clinicians on the local policy to improve the appropriateness of VTE prophylaxis prescribing and minimise risk of subtherapeutic or supratherapeutic dosing in extremes of body weight or renal impairment.[2]
- The lack of a commercially available enoxaparin 30mg product may be a barrier to prescribing.[3] Further audits can be conducted to assess if there is consumer need for manufacturing a 30mg enoxaparin pre-filled syringe based on prescribing rates.

Limitations

- The results of the audit are specific to a single tertiary hospital and orthopaedic and general medicine patients only.
- If height and weight were not documented during admission, auditors were unable to retrospectively calculate BMI or CrCl to accurately assess enoxaparin dose for VTE prophylaxis. In a prospective study design, these parameters could be measured.

Conclusion

The majority of prescribed VTE prophylaxis treatments in orthopaedic and general medicine patients at SVHM were prescribed according to hospital policy.

If a patient required a dose adjustment due to weight or renal function, the prescribed VTE prophylaxis did not always adhere to the policy.

References

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