

Evaluation on the Use of Low Molecular Weight Heparins in Malignant Hematology Patients with Venous Thromboembolism



Henry Pun^{1,2} BSc, MSc, PharmD, Ian Pang¹ BMSc, MSc, BScPharm, ACPR, Kori Leblanc^{1,2} BScPhm, PharmD, ACPR, Patwant Dhillon¹ BHSc, PharmD, ACPR, Cassandra McEwan¹ Hons BSc, BScPharm, PharmD, ACPR, Priya Patel¹ BSc, PharmD, ACPR, Rajat Kumar^{1,2} FRCPC

¹University Health Network, Toronto, ²Leslie Dan Faculty of Pharmacy, University of Toronto, Toronto, ON

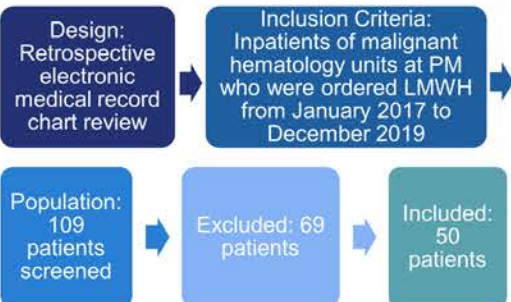
Background

- Cancer and cancer-related treatments are significant independent risk factors for malignant hematology patients in developing venous thromboembolisms (VTE)¹
- Treatment of VTE in malignant hematology patients at the Princess Margaret Cancer Centre (PM) is predominantly initiated with LMWH in accordance with guidelines^{2,3}
- There is a lack of consistent practice with variation in both the use of conditional orders as well as the threshold of platelet values for conditional orders

Objectives

- **Primary:** To describe the use of conditionally ordered LMWH based on platelets values
- **Secondary:** To determine its safety by measuring administration concordance with conditional orders and bleeding event rates during inpatient admission
- **Tertiary:** To determine its efficacy by measuring the rate of worsening VTE or recurrence during inpatient admission

Methods



Results

Table 1: Patient characteristics

Conditional (%) vs Unconditional (%)	(n=30)	(n=20)
Median Age – Years (SD)	59 (±18.5)	61 (±19.9)
Hematological Malignancy:		
Acute Lymphoblastic Leukemia	10 (33)	5 (25)
Acute Myeloid Leukemia	7 (23)	6 (30)
Hodgkin's Disease	1 (3)	1 (5)
Non-Hodgkin's Lymphoma	2 (6)	2 (10)
Others (Multiple Myeloma/ Myelodysplastic syndrome/ Myeloproliferative Neoplasms)	10 (33)	6 (30)
LMWH used for treatment:		
Tinzaparin	15 (50)	11 (55)
Enoxaparin	11 (37)	6 (30)
Dalteparin	4 (13)	3 (15)

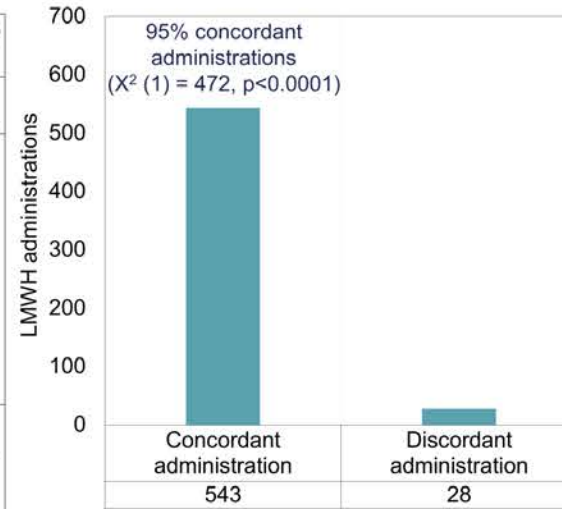


Figure 2: Administration concordance with conditional orders

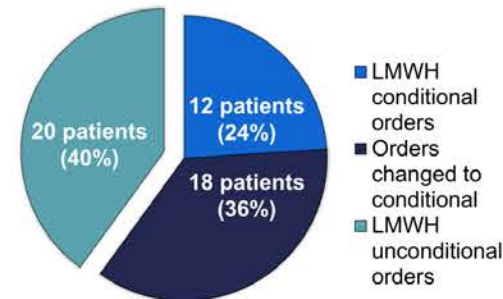


Figure 1: LMWH orders (conditional vs unconditional)

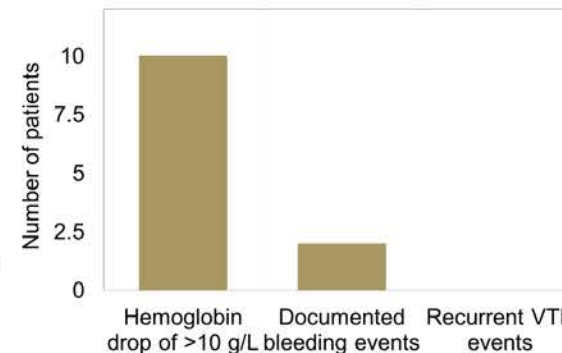


Figure 3: Safety and recurrent events with conditional orders

Discussion

- In this retrospective chart review, 60% of patients were treated with a conditionally ordered LMWH
- 95% of conditional orders were concordantly administered, suggesting conditional orders can be safely followed
- The low number of bleeding events and lack of worsening/recurrent VTE events suggests that this is a safe and effective strategy to treat VTE in malignant hematology patients with thrombocytopenia

Limitations

- Retrospective electronic chart review limits assessment of bleeding and recurrence rates to practitioner-dependent documentation

Future Directions

- Future prospective studies will focus on expanding the number of patients screened to add to the limited data pool
- Conducting a quality improvement study of a standardized conditional order set for LMWH based on platelet values at PM

References:

1. Kekre, N. & Connors, J. M. Venous thromboembolism incidence in hematologic malignancies. *Blood Rev.* 33, 24–32 (2019).
2. Key, N. S. et al. Venous Thromboembolism Prophylaxis and Treatment in Patients With Cancer: ASCO Clinical Practice Guideline Update. *J. Clin. Oncol.* JCO.19.01461 (2019)
3. Farge, D. et al. 2019 international clinical practice guidelines for the treatment and prophylaxis of venous thromboembolism in patients with cancer. *Lancet Oncol.* 20, e566–e581 (2019).