Assessing the management of patients with suspected heparin-induced thrombocytopenia at a community hospital

Jennifer Trodella, PharmD; Kaitlin Reynolds, PharmD; Mindy Anders, PharmD

Northern Light SM
Eastern Maine Medical Center

Background

Heparin-induced thrombocytopenia (HIT) is a prothrombotic and potentially life-threatening adverse drug reaction.[1] It occurs when immunoglobulin G antibodies form in response to heparin and platelet factor 4 (PF4) complexes,[2-3] causing platelet activation and thrombin generation.[4] The cardinal manifestation of HIT is thrombocytopenia, but patients are also at an increased risk of thromboembolism.[3]

Although an immune response is common, occurring in up to 50% of patients receiving heparin[3], the true incidence of HIT[5] and severe complications are significantly lower[3] (0.1-7% and 0.2-3%, respectively). Nevertheless, delays in treatment can have devastating consequences, as the daily risk of thrombosis, amputation, or death is 5-10% in untreated patients.[1]

In 2018, the American Society of Hematology (ASH) published evidence-based guidelines to support the diagnosis and management of patients with HIT. According to the guidelines, the 4Ts score is recommended to estimate the probability of HIT. [5] This approach considers the degree of thrombocytopenia, timing of platelet count decline, presence or absence of thrombosis, and other potential causes of thrombocytopenia. Calculating a 4Ts score is the first step in the ASH's algorithm for diagnosing and managing patients with suspected HIT.

Aims

Primary: Quantify provider adherence to recommendations within the 2018 ASH HIT management guidelines. Following this analysis, patients were allocated into group A (managed in accordance with ASH recommendations for laboratory testing) or group B (managed with an alternative strategy for laboratory testing).

Secondary: Compare the hours of alternative anticoagulation and length of stay between groups

Disclosures and references

The authors of this research have no conflicts of interest to disclose.

1. Cuker A, Gimotty PA, Crowther MA, Warkentin TE. Predictive value of the 4Ts scoring system for heparin-induced thrombocytopenia: A systematic review and meta-analysis. *Blood*. 2012;120(20), 4160-4167. doi:10.1182/blood-2012-07-443051. Accessed August 17, 2021.
2. Cuker A, Arepally GM, Chong BH, et al. Heparin-induced thrombocytopenia. *Blood*. 2017;129(21), 2864-2872. doi:10.1182/blood-2016-11-709873. Accessed August 17, 2021.
3. Arepally GM. Heparin-induced thrombocytopenia. *Blood*. 2017;129(21), 2864-2872. doi:10.1182/blood-2016-11-709873. Accessed August 17, 2021.
4. Samhouri Y, Telfah M, Kouides R, Woodlock T. Utilization of 4T score to determine the pretest probability of heparin-induced thrombocytopenia in a community hospital in upstate New York. *J Community Hosp Intern Med Perspect*. 2016;6(4), 32522. doi:10.3402/jchimp.v6.32522. Accessed August 17, 2021.
5. Cuker A, Arepally GM, Chong BH, et al. American Society of Hematology 2018 guidelines for management of venous thromboembolism: Heparin-induced thrombocytopenia. *Blood Adv*. 2018;2(22), 3360-3392. doi:10.1182/bloodadvances.2018024489. Accessed August 17, 2021.

Methods

Approved via Eastern Maine Medical Center Institutional Review Board (#2021-023) under exempt status

Study design: Retrospective, observational chart review of patients admitted to Eastern Maine Medical Center between May 2019 and May 2021

Inclusion criteria: Patients ≥ 18 years of age with suspected HIT during admission

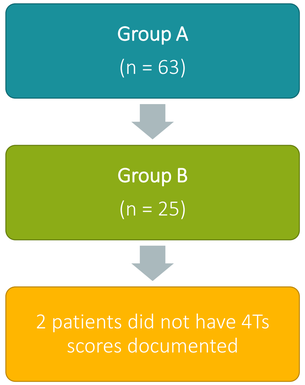
Exclusion criteria: Patients who underwent cardiac surgery during admission, were pregnant and/or lactating, had repeat PF4 testing within the study period, or had not received heparin or low molecular weight heparin within the past 100 days

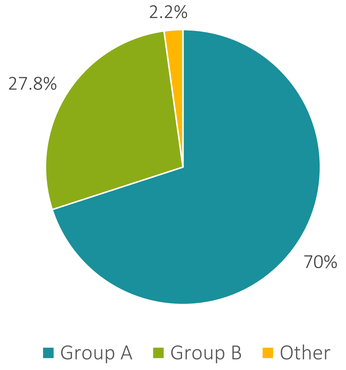
Statistical analyses: Baseline characteristics were analyzed using Fisher's exact test (nominal variables) and the student's t-test (continuous variables). Secondary aims were analyzed using the Wilcoxon rank sum test. All statistical analyses assumed a significance level of 0.05.

Results: Enrollment

Of the 135 patients initially screened, 23 did not receive heparin or low molecular weight heparin within the past 100 days, 15 underwent cardiac surgery during admission, 4 had an HIT order set placed for an alternative indication, and 3 had repeat PF4 testing within the study period. A total of 90 patients were included for analysis.

Results: Primary aim





Results: Baseline characteristics

Characteristic	Group A (n = 63)	Group B (n = 25)	P-value
Mean age (SD) – years	69 (13.23)	69 (13.27)	0.95
Male sex – no. of patients (%)	23 (36.5)	16 (64)	0.03
Race – no. of patients (%)			
White	62 (98.4)	25 (100)	1.0
Black or African American	1 (1.6)	0 (0)	N/A

Results: Secondary aims

Secondary aims		Group A (n = 63)	Group B (n = 25)	P-value
Alternative anticoagulation	Duration, hours	95 (1-652)	191 (14-565)	0.18
	Indicated – no.	62	1	N/A
	Initiated – no.	26	7	N/A
	Warranted – no.	26	0	N/A
Average length of stay	Days	17.4	16.2	0.48

Discussion

Our research demonstrated discordance between provider adherence to various recommendations within the 2018 ASH HIT guidelines. Of those initially screened, 17% of patients were managed for HIT, but did not receive heparin or low molecular weight heparin within the past 100 days. Our results suggest opportunities to improve HIT management.

Limitations

As a retrospective and observational study, there were innate limitations within the design. Another noteworthy limitation is we considered appropriate HIT management as patients who had PF4 assays ordered correctly, neglecting the remainder of the ASH's algorithm for diagnosing and managing patients with suspected HIT. Additionally, we did not address whether the patients who received alterative anticoagulation received it appropriately, in accordance with the ASH guidelines. Future research will analyze the impact of pharmacist involvement in the management of patients with suspected HIT.