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Heparin-induced thrombocytopaenia (HIT): an audit of the diagnostic pathway at Barts Health NHS Trust

M HAYWOOD, L BOWLES, S PLATTON, P MACCALLUM
Barts Health NHS Trust

Barts Health NHS Trust

INTRODUCTION

HIT is an uncommon but serious complication of heparin therapy, affecting approximately 1 in 5000 hospitalised patients, which can cause significant morbidity and mortality. It is characterised by the development of antibodies against the platelet factor 4/heparin complex, resulting in thrombocytopaenia and a prothrombotic state.

The diagnosis of HIT is difficult and requires integration of clinical and laboratory data. Diagnosis of HIT at the Royal London Hospital is based on BSH guidelines, starting with a pre-test probability assessment using the 4T score.

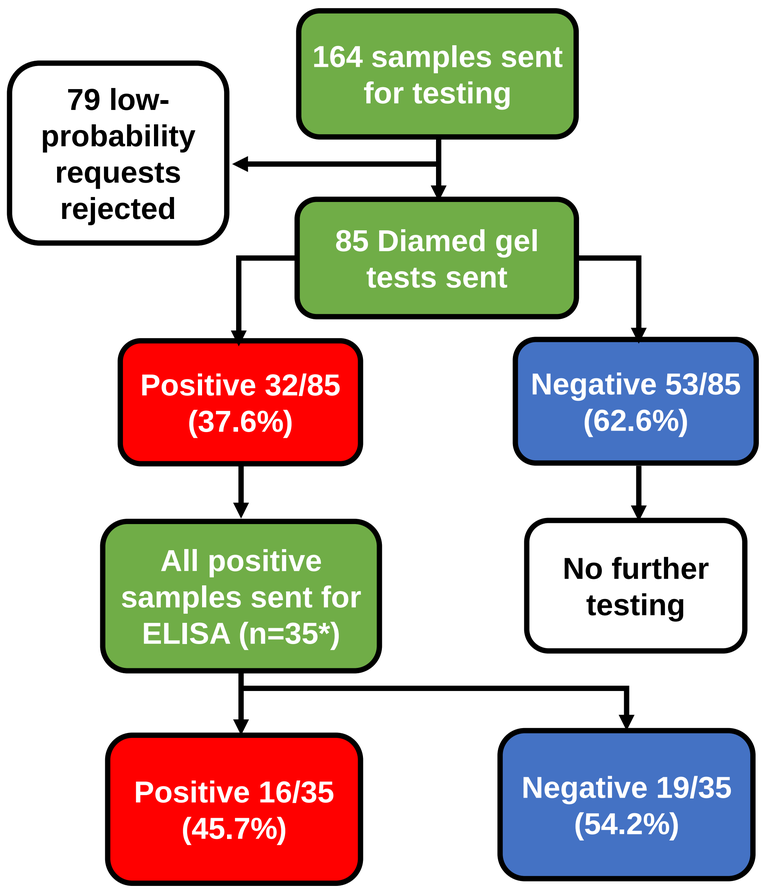
THE 4T SCORE

	2 points	1 point	0 points
Thrombocytopaenia	>50% fall and platelet nadir ≥20 x 10^9/l	30-50% fall or platelet nadir 10-19 x 10^9/l	Fall <30% or platelet nadir <10 x 10^9/l
Timing of platelet count fall or other sequelae	Clear onset between days 5-10; or ≤1 day (if heparin exposure within past 30 days)	Consistent with immunisation but not clear (e.g. missing platelet counts) or onset of thrombocytopaenia after day 10; or fall ≤1 day (if heparin exposure 30-100 days ago)	Platelet count fall too early ≤4 days (without recent heparin exposure)
Thrombosis or other sequelae (e.g. skin lesions)	New thrombosis; skin necrosis; post-heparin bolus acute systemic reaction	Progressive or recurrent thrombosis; erythematous skin lesions; suspected thrombosis not yet proven	None
o**T**her cause for thrombocytopaenia not evident	No other cause for platelet count fall evident	Possible other cause evident	Definite other cause for thrombocytopaenia

METHOD

This audit examined all suspected cases of HIT at Barts Health Trust in 2015-2018. Demographic information was collected, as well as reasons for admission, the 4T score from the request (if provided by the referrer), and the results of subsequent laboratory testing. Documentation in the patients' notes pertaining to each diagnosis (if available) was also examined.

RESULTS



* 32 screening-positive cases, plus 3 additional cases for which Diamed screening cards were temporarily unavailable.

Following testing, a total of 12 positive diagnoses of HIT were made based on a combination of 4T scoring, lab testing and the overall clinical picture.

The following table details all 12 diagnoses and the corresponding 4T scores with lab testing. Note ELISA optical densities were not reliably recorded lab/patient records.

Case	4T	Gel	ELISA	OD	HIPA
1.	3-4	Positive	Positive		Positive
2.	6	Positive	Positive		
3.		Positive	Positive		
4.	3	Positive	Positive		Positive
5.	5	Positive	Positive		
6.	5	Positive	Positive		
7.	6	Positive	Positive	1.893	
8.	3	Positive	Positive	1.606	
9.	5-6	Positive	Positive	0.95	Negative
10.	5-6	Positive	Positive	1.957	
11.	6	Positive	Positive		
12.	5	Positive	Positive		

DIAGNOSTIC PATHWAY

The diagnostic pathway at Barts Health suggests that cases with a 4T score of >3 warrant screening (0-3 being low probability, 4-5 intermediate and 6-8 high).

Initial screening is with rapid particle gel immunoassay (Diamed). Positive cases then go on to ELISA testing, reported as positive/negative +/- optical density (OD).

Weakly positive OD (0.4-1.0) treated as *possible* HIT, and heparin-induced platelet aggregation (HIPA) sent.

Strongly positive OD (>1) treated as *likely* HIT.

CONCLUSIONS

The results show that the diagnostic pathway is largely followed, with all screening-positive samples for further ELISA testing, and no further testing done on screening-negative samples.

Of the 164 samples sent to the lab, only 57 (34.8%) included the 4T score. It should be noted that 3 of the 12 diagnosed HIT cases (numbers 1, 4 and 8 in the table above) had initial gel screening tests sent despite a 4T score of 3 (low probability) – further testing was undertaken in these cases due to high clinical suspicion. In two of these cases (numbers 1 and 4), confirmatory HIPA testing was sent and was positive.

It is also interesting to note that the third of the low-scoring cases (number 8 in the table) returned a strongly positive ELISA optical density of 1.606, indicating high probability of HIT.

Overall, the results helped to illustrate the difficulties in diagnosing HIT. The low proportion of requests including the 4T score (an invaluable clinical detail given that diagnosis relies on clinical as well as lab data) is a concern and indicates a need for further education of clinicians in the diagnostic complexity of HIT.

REFERENCES

Watson, H., Davidson, S., Keeling, D. (2012) Guidelines on the diagnosis and management of heparin-induced thrombocytopaenia: second edition. *British Journal of Haematology,* **159**, 528-540

Guidelines for the Diagnosis, Investigation and Management of Heparin-Induced Thrombocytopaenia (HIT) – Royal London Hospital (Updated August 2016)

CONTACT INFORMATION

Dr Martin Haywood (IMT2)
North Middlesex University Hospital
Email: m.Haywood@nhs.net

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Martin Haywood
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