

A Service Evaluation of Venous Thromboembolism Prophylaxis Dosing during the first COVID-19 wave in the Intensive Care Unit, Queen Alexandra Hospital, Portsmouth

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Introduction

In December 2019 the first case of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was identified. Its predominant features are respiratory symptoms; however, in severe disease coagulopathy is commonplace and anecdotal reports from the early pandemic and emerging evidence described an increased incidence of venous thromboembolism (VTE) in patients being treated for COVID-19. There have been ongoing trials researching whether therapeutic anticoagulation or increased prophylaxis dose anticoagulation is of benefit in patients being treated for COVID-19.

Given this emerging evidence, there is a need to research the potential role of anticoagulation and thromboprophylaxis in preventing these complications. Our thromboprophylaxis policy changed during the first wave and this study aims to evaluate whether this impacted the number of patients with a confirmed VTE.

Methodology

We performed a service evaluation of all patients admitted to ICU at Queen Alexandra Hospital Portsmouth with confirmed COVID-19. Patients admitted from 10/03/2020 to 12/05/2020 were included. Patients were investigated for VTE based on clinical suspicion. Patients were observed until discharge from ICU, death, or transfer.

After interim analysis of this evaluation, on the 11th April 2021, the ICU venous thromboprophylaxis policy was changed to enhanced prophylaxis dose for patients being treated for COVID-19.

Enoxaparin Prophylaxis Dosing in Standard vs Enhanced Dosing

Renal Function	Weight	Standard dose	Enhanced Dose
eGFR >30	<50 kg	20mg OD	20mg BD
	50-100kg	40mg OD	40mg BD
	>100kg	40mg BD	60mg BD
eGFR 15-30	<50kg	20mg OD	20mg OD
	>50kg	20mg OD	40mg OD
eGFR <15 or RRT	All adults	20mg OD	20mg OD

Table showing enhanced and standard thromboprophylaxis dosing with enoxaparin

Patients Admitted to ICU with Confirmed Covid 10/3/2020-10/4/2020

	Standard Thromboprophylaxis	Enhanced Thromboprophylaxis	Total
Total Patients	37	5	42
CT/Doppler imaging	15	4	19
PE	6	0	6
CVA	0	0	0
DVT	2	0	2

Patients Admitted to ICU with Confirmed Covid 11/4/2020 – 12/5/2020

Total Patients	8	13	21
CT/Doppler Imaging	7	11	18
PE	2	6	8
CVA	2	1	3
DVT	0	0	0

Table comparing patients before and after official change in guideline

Results

69 patients were admitted to ICU at QAH between 10/03/2020 to 12/05/2020 with confirmed COVID-19.

Of these patients:

- 37 were investigated for VTE.
- 17 patients had a thromboembolic event
- 15 patients had a PE, of which 2 also had embolic strokes.
- 2 patients had a DVT.

45 patients received standard thromboprophylaxis, 18 received enhanced prophylaxis, 4 received treatment dose, and 1 patient received no thromboprophylaxis. Adverse events were only found in 1 patient receiving treatment dose.

Conclusions

This evaluation was able to identify early the increased risk of VTE in COVID patients, and the utility of d-dimers to help consider VTE. Interim analysis demonstrated 50% of patients investigated had confirmed VTE leading to a change in thromboprophylaxis policy for COVID patients.

The overall rate of confirmed VTE in our cohort was 27%. However, of those who underwent investigation, positive findings were found in 46%. 85% of patients admitted after 10/4/2020 were investigated, which likely reflects increasing recognition of the issue and improved team confidence in transferring COVID patients. Overall, the evaluation is likely to have underestimated thrombosis rates, given the low imaging rate prior to April 2020.

Comparing VTE rates between those who received standard and enhanced VTE prophylaxis showed no significant effect (50% vs 40%, p-value 0.425), indicating that enhanced VTE prophylaxis is unlikely to confer substantial benefit. There was no significant harm found from enhanced prophylaxis.

In conclusion, this study demonstrates VTE is a significant concern in patients being treated for COVID-19 in an ICU setting. Emerging evidence from large trials, suggest that anticoagulation may be of benefit in hospitalised but not ICU patients.

VTE and Imaging Rates in Patient's receiving standard vs enhanced prophylaxis

	Standard	Enhanced	Total
Total Patients	45	18	63
CT/Doppler Imaging	22 (48.9%)	15 (83.3%)	37
VTE found	11 (24%)	6 (33%)	17
Confirmed VTE of those imaged	50%	40%	p=0.425

Table comparing patients receiving standard vs enhanced prophylaxis

References

1. Cui S, Chen S, Li X, Liu S, Wang F. Prevalence of venous thromboembolism in patients with severe novel coronavirus pneumonia. *J Thromb Haemost.*
2. Malas MB, Naazie IN, Elsayed N, Mathlouthi A, Marmor R, Clary B. Thromboembolism risk of COVID-19 is high and associated with a higher risk of mortality: A systemic review and meta-analysis. *EClinicalMedicine.*
3. British Thoracic Society. BTS Guidance on Venous Thromboembolic Disease in patients with COVID-19. *BTS.*
4. The REMAP-CAP, ACTIV-4a, and ATTACC Investigators (2021). Therapeutic Anticoagulation with Heparin in Critically Ill Patients with Covid-19. *The New England Journal of Medicine*; DOI: 10.1056/NEJMoa2103417