

# IS FULL-DOSE REALLY FULL-DOSE IN COVID-19 PATIENTS?

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## Background

- Several publications have highlighted the hypercoagulable state often seen in SARS-Corona virus disease (COVID-19) disease<sup>1</sup> which reflects a poor prognosis<sup>2</sup>
- Pathophysiology: Complement-mediated endothelial injury, cytokine-induced SIRS, Antiphospholipid antibody & vascular stasis (under investigation).
- COVID-19 patients are often placed on anticoagulation therapy with Enoxaparin, either for prophylactic or therapeutic purposes.
- Thrombosis with full-dose of anticoagulation is (although rare) has been reported in COVID-19 cases.
- The exact prevalence and mechanism for this phenomenon is currently unknown.

## Case History

- 46-year-old male with diabetes mellitus (type 2) on Metformin presented to ED with shortness of breath and cough for 7 days.
- ED Vitals: Temp 100 F, HR 119, RR 30/min, BP 127/85 mm Hg, O<sub>2</sub> Sat 88% on RA.
- Nasopharyngeal swab for COVID-19 PCR was positive.
- Chest x-ray revealed multifocal pneumonia.
- Elevated Inflammatory markers
- Patient was admitted to ICU for acute hypoxic respiratory failure and placed on NRB. Remdesivir, Dexamethasone, Convalescent plasma, Ceftriaxone & Azithromycin were initiated
- D-Dimer was 0.47 on admission and continued to increase; therefore, 0.5 mg/kg Enoxaparin Q24h (initiated as prophylactic dose) was increased to 1mg/kg Q12h (therapeutic dose) on day 4.
- Right ventricular thrombus on TTE (day 14) and Right saphenous vein thrombus on LE Doppler US,(day 35)
- Due to worsening respiratory status, patient was intubated, transitioned to VV ECMO and initiated on heparin drip
- Repeat TTE (day 30) showed no evidence of thrombus. Heparin was transitioned to Enoxaparin and patient was placed on Rivaroxaban (3-month course).

## Discussion

- This patient developed DVT and RV thrombus while he was on full therapeutic dose of Enoxaparin (1 mg/kg Q12H).
- Both arterial and venous thromboembolic events such as ischemic stroke, acute limb ischemia and disseminated intravascular coagulation has been reported frequently in SARS-COVID-19 infection.
- Potential Therapies: Enoxaparin, Dalteparin, Nadroparin, Tinzaparin, Unfractionated Heparin (in patients with renal impairment), plasmapheresis & intravenous immunoglobulin<sup>4</sup>
- Unstable COVID-19 patients have been reported to receive tPA.

## Conclusion

- COVID-19 patients are predisposed to thromboembolic events as the disease course can exacerbate all the aspects of Virchow's triad.
- Even therapeutic doses are sometimes not effective as evident by this case(cause currently unknown)
- Clinicians are encouraged to keep a high index of suspicion for VTE events, even when COVID-19 patients are on therapeutic anticoagulation.

## References

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