Journal of Pharmaceutical Research International

33(60A): 315-318, 2021; Article no.JPRI.78039
ISSN: 2456-9119
(Past name: British Journal of Pharmaceutical Research, Past ISSN: 2231-2919, NLM ID: 101631759)

Acute Pulmonary Embolism Post COVID-19 Pneumonia – A Case Report

M. Nitharsha Prakash [a*≡], N. N. Anand [aφ], Karthick Ramalingam [a#] and G. Venkat Sai [a≡]

[a] *Department of Medicine, Sree Balaji Medical College and Hospital, Chrompet, Chennai, India.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i60A34490

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/78039

Case Report

Received 15 November 2021
Accepted 18 December 2021
Published 19 December 2021

ABSTRACT

COVID-19 has been associated with multiple venous thromboembolism events such as pulmonary embolism and deep vein thrombosis. Here we report a 64-year male with COVID-19 pneumonia who developed pulmonary thromboembolism following the COVID illness. This patient developed VTE complication in spite of receiving anti-coagulation therapy during admission. This case brings out the need for evidence-based post-discharge VTE prophylaxis approach and guidelines in patients who recover from COVID-19.

Keywords: COVID-19; VTE; CT pulmonary angiogram.

1. INTRODUCTION

The hypercoagulability state seen in COVID-19 has been associated with thromboembolic complications [1]. The VTE risk appears highest in those with critical care admission [2]. No clear-cut evidence-based recommendations exist for prevention of venous thromboembolism events. Usually institutional protocol provides thromboprophylaxis to COVID-19 patients during

[≡] *Junior Resident;*
[φ] *Professor and HOD;*
[#] *Assistant Professor;*
**Corresponding author: E-mail: natharsha.merlions@gmail.com;*

admission. We report a case of thromboembolism complicationfollowing COVID-19.

2. CASE REPORT

A 64-year-old male presented with breathlessness for the past 20 minutes to the emergency ward. The breathlessness was sudden in onset, not aggravated on exertion. No history of fever, cough or cold. History of chest pain, retrosternal, non-radiating, pleuritic type of pain was present. No history of palpitations. The patient had no prior history of co-morbidity. The patient gives history of admission 1 month ago for COVID-19 infection and confined to bed for 13 days. High resolution CT (HRCT) chest taken during the COVID infection showed CORADS-5 with 10-20% lung involvement. His D-Dimer was 1652 ng/dL (Normal <500ng/dL) during the course of COVID illness and he received injection Heparin 5000 units twice daily for five days. A follow-up at 10 days later revealed resolution of COVID changes (Lung involvement - 5%) in HRCT.

On examination, the patient was conscious, oriented and afebrile. He had tachycardia and tachypnoea. However, saturation was within normal limits. BP was 130/80mmHg. Electrocardiography (ECG) showed sinus tachycardia. With suspicion of Pulmonary Embolism, Computed Tomography Pulmonary Angiogram was done and it showed evidence of pulmonary artery embolism in the main right pulmonary artery extending through the bifurcation into the left pulmonary artery and into the interlobar branches. The patient underwent thrombolysis with Unfractioned Heparin and switched to Injection Low Molecular Weight Heparin 60mg twice daily. D-dimer was 10000ng/dL (Normal <500ng/dL). Doppler study of the lower limb did not reveal any stasis of blood flow or thrombus or stenosis in the artery. The patient improved following therapy and he was switched over to oral anti-coagulant dabigatran after 5 days of parenteral anticoagulation. The patient was discharged and advised to follow-up in out-patient department.

3. DISCUSSION

COVID-19 pandemic has been ravaging the world for months already and now post infection complications are beginning to be found. Individuals with COVID-19 may have a number of complex and varied coagulation abnormalities (in the direction of an underlying hypercoagulable state) [2]. The predominant coagulation abnormalities in patients with COVID-19 suggest a hypercoagulable state and are consistent with uncontrolled clinical observations of an increased risk of venous thromboembolism [3]. It has been named as a COVID-19 associated coagulopathy (CAC) or thrombo-inflammation [4,5]. The pathogenesis of the hypercoagulability is still not understood. However, an autopsy study that compared pulmonary pathology from seven individuals who died of COVID-19 found a severe endothelial injury (endotheliitis), widespread thrombosis with microangiopathy and alveolar capillary microthrombi, and increased angiogenesis, all of which were significantly more prominent in the lungs of the patients who died of COVID-19. Endothelial injury found in these patients is a hallmark of Virchow's triad [6]. However the development of the thromboembolism raises many questions about the incidence, risk factors for developing the complication and the prevention and management strategies for the same. Similar cases have been reported elsewhere [10-12]. In a large study that involved over 3000 individuals admitted to the hospital, most of whom received prophylactic-dose anticoagulation, risk factors for Venous Thrombo-embolism (VTE) on multivariate analysis were older age, male sex, Hispanic ethnicity, coronary artery disease, prior myocardial infarction, and higher D-dimer (>500 ng/mL) at hospital presentation [1]. VTE was associated with an increased mortality rate (adjusted hazard ratio [HR], 1.37; 95% CI 1.02-1.86).

A case series of COVID-19 patients with VTE found VTE events more likely in patients admitted in ICU, sometimes despite receiving anti-coagulant therapy in ICU. Many reports of DVT have also been noted during and following the COVID infection. Patients who developed VTE were found to have high D-dimer, high fibrinogen, normal or mildly prolonged PT and normal or decreased platelet count [7]. However, these laboratory derangements do not provide sufficient incentive to intervene. Although, no high-quality studies exist to dictate streamlined management strategies, there has been practice guidelines issued by many national health bodies to combat this complication [8,9]. Hence,clinicians resort to institutional practices which may vary in aggressiveness in approach. Two new autopsy studies, together including a total of 33 individuals who died of COVID-19, have revealed common causes of death to be

pneumonia and pulmonary embolism. Hence prevention of VTE will be very essential in bringing down the mortality of COVID-19.

4. CONCLUSION

While, thromboembolic complications have been found in patients with COVID-19 [10,12], there still exists no safely proven effective preventive therapy for the same. Clinical trials to establish must be carried out to find the same. However, this case is essential to medical literature as the incidence of the post COVID-19 thromboembolism could have implications in management of the same as the pandemic ensues.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Teuwen LA, Geldhof V, Pasut A, Carmeliet P. COVID-19: the vasculature unleashed. Nat Rev Immunol. 2020;20:389.
2. Lowenstein CJ, Solomon SD. Severe COVID-19 Is a Microvascular Disease. Circulation. 2020;142:1609.
3. Libby P, Lüscher T. COVID-19 is, in the end, an endothelial disease. Eur Heart J 2020;41:3038.
4. Klok FA, Kruip MJHA, van der Meer NJM, et al. Incidence of thrombotic complications in critically ill ICU patients with COVID-19. Thromb Res 2020;191:145.
5. Connors JM, Levy JH. Thromboinflammation and the hypercoagulability of COVID-19. J Thromb Haemost. 2020;18:1559.
6. Ackermann M, Verleden SE, Kuehnel M, et al. Pulmonary Vascular Endothelialitis, Thrombosis, and Angiogenesis in Covid-19. N Engl J Med. 2020;383:120.
7. Wichmann D, Sperhake JP, Lütgehetmann M, Steurer S, Edler C, Heinemann A, Heinrich F, et al. Autopsy Findings and Venous Thromboembolism in Patients With COVID-19: A Prospective Cohort Study. Annals of Internal Medicine. 2020; 173(4), 268–277. Available:https://doi.org/10.7326/M20-2003
8. Kyriakoulis KG, Kollias A, Kyriakoulis IG, Kyprianou IA, Papachrysostomou C, Makaronis P, Kotronias RA, Terentes-Printzios D, Toskas I, Mikhailidis DP. Thromboprophylaxis in Patients with COVID-19: Systematic Review of National and International Clinical Guidance Reports. Curr Vasc Pharmacol; 2021 Aug 24. DOI:10.2174/1570161119666210824160332. Epub ahead of print. PMID: 34431465.
9. MacDougall K, Spyropoulos AC. Prevention of Venous Thromboembolism in Acutely Ill Medical Patients: A New Era. Semin Respir Crit Care Med. 2021 Apr;42(2):308-315. DOI: 10.1055/s-0041-1723018. Epub 2021 Feb 6. PMID: 33548931.
10. Brem FL, Missaoui Z, Arghal M, Rasras H, Aichouni N, Skiker I, Ouafi NE, Zakaria B. Late-onset of pulmonary embolism following hospitalization for COVID-19 despite thromboprophylaxis: a report of two cases. Pan Afr Med J. 2021 Mar 1;38:226. DOI: 10.11604/pamj.2021.38.226.28503. PMID: 34046131; PMCID: PMC8140687.
11. Rashidi F, Barco S, Kamangar F, Heresi GA, Emadi A, Kaymaz C, Jansa P, Reis A, Rashidi A, Taghizadieh A, Rezaeifar P, Moghimi M, Ghodrati S, Mozafari A, Foumani AA, Tahamtan O, Rafiee E, Abbaspour Z, Khodadadi K, Alamdari G, Boodaghi Y, Rezaei M, Muhammadi MJ, Abbasi M, Movaseghi F, Koohi A, Shakourzad L, Ebrahimi F, Radvar S, Amoozadeh M, Fereidooni F, Naseari H, Movalled K, Ghorbani O, Ansarin K. Incidence of symptomatic venous thromboembolism following hospitalization for coronavirus disease 2019: Prospective results from a multi-center study. Thromb Res. 2021 Feb;198:135-138. DOI: 10.1016/j.thromres.2020.12.001. Epub 2020 Dec 11. PMID: 33338976; PMCID: PMC7836837.\

12. Taha M, Nguyen P, Sharma A, Taha M, Samavati L. Forty-One-Year-Old Man with Pulmonary Embolism 5 Months After COVID-19. Clin Med Insights Circ Respir Pulm Med. 2021;15: 11795484-20986659. Published 2021 Feb 8. DOI:10.1177/1179548420986659

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/78039